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FISCAL YEAR 1992

USDA - Forest Service

The Forest Service, U.S. Department of Agriculture, provides leadership in the management, protection, and use of the Nation's forests and rangelands. The agency operates under the concept of multiple use, providing sustained yields of renewable resources such as water, forage, wildlife, wood, and recreation. The Forest Service is committed to the preservation of wilderness, biodiversity, and landscape beauty as well as the protection of the basic resources of soil, water, and air quality in its management of these lands.

The Forest Service is responsible for the 191-million-acre National Forest System, with its 156 national forests and 19 grasslands in 44 States, Puerto Rico, and the Virgin Islands. In addition, the agency works with State land management organizations to help private landowners apply good natural resource management practices on their lands. The International Forestry arm of the Forest Service enables the agency to share its technical expertise and managerial skills with other nations. The Research arm of the Forest Service conducts extensive research to enhance and protect productivity on all of America's forests and rangelands, with special attention to long-term natural resource issues of national and international scope.

The management of the National Forest System is guided by the Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974, as amended, and by the National Forest Management Act (NFMA) of 1976. Together, these laws encourage foresight in the use of the Nation's natural resources, and establish a long-range planning process for the management of the National Forest System. RPA focuses on the national long-range direction for natural resource conservation, while NFMA provides guidance on integrating the national direction with the planning and management for the National Forest System units.

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Report of the Forest Service

Fiscal Year 1992

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Selected FY 1992 Statistics

National Forest System	191 Million Acres
Recreation Use	288 Million Visitor Days
Trail System	120,284 Miles
National Scenic Byways	6,000 Miles
National Wild and Scenic Rivers System	4,316 Miles National Forest System
Lands Burned By Wildfire	530,000 Acres
Insect and Disease Suppression	1.7 Million Acres
Wilderness	34 Million Acres
Watershed Improvements	36,201 Acres
Wildlife and Fish Habitat Improvements	242,761 Acres
Reforestation	492,000 Acres
Livestock Grazing	9.4 Million Animal Unit Months
Grazing Allotments Administered	9,940 Permits
Mineral Cases Processed	26,539
Timber Sold	4.4 Billion Board Feet
Timber Harvested	7.2 Billion Board Feet
Road System	369,000 Miles

Woodland Owners Assisted	190,211
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Research Results Published	2,673 Publications
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Permanent and Excepted Full-Time Employees	36,137
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Human Resource Programs	142,468 Persons Served
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Expenditures	\$3.87 Billion
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Receipts	\$1.39 Billion
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iv	Introduction Chief's Message 1
2	Overview Major Program Areas 3 Continued Evolution of Ecosystem Management and Stewardship 3 The RPA Strategic Plan—Four Strategic Themes 5 Evolving Administrative Initiatives 12 Summary 14
16	Program Performance and Accomplishments National Forest System 17 State and Private Forestry 59 International Forestry 69 Forest Research 73 Administration 81
88	Tables Tables Index 89 National Forest System 92 State and Private Forestry 168 Forest Research 182 Administration 192
202	Glossary of Terms
208	Legislative Basis for Report
210	Index



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Chief's Message

My June 4 announcement of the ecosystem management approach to managing the national forests and grasslands, along with the elimination of clearcutting as a standard timber harvest practice, was a major policy change for the Forest Service. By ecosystem management, we mean that an ecological approach will be used to achieve multiple-use management of the National Forest System. Through this, we will better blend the needs of people and environmental values in ways that sustain diverse, healthy, and productive ecosystems.

This is a tall order, but I am confident the Forest Service, in partnership with the American people, will make good progress in implementing these changes over the next 3-5 years. The end result will be a more environmentally sensitive management of the national forests and grasslands, with visible results on the ground.

We are also significantly reorienting our research program as a result of our ecosystem management policy. Research priorities are being changed to reflect the land managers' strong need for additional scientific information to implement ecosystem management. Perhaps even more important, we are forging a stronger partnership between researchers and land managers. Forest Service scientists are spending more time working directly with land managers to ensure that the best available scientific information is used when land management decisions are made.

In addition to caring for National Forest System lands, the Forest Service continues to provide technical and financial assistance to State and private forest landowners. This contributes to effective management and good stewardship on about 500 million acres of private forest lands for timber, wildlife, recreation, and other purposes. Our urban and community forestry program directly improves the quality of the environment in which most of our citizens live and work.

The Forest Service was very active in international forestry activities this year. As part of the United States delegation to the United Nations Conference on the Environment and Development (UNCED) in Rio de Janeiro, Brazil, the Forest Service participated in major international negotiations about the world's forests. The negotiations led to the Statement of Forest Principles, an international consensus on the conservation and sustainable use of forests around the world, and to Agenda 21, a comprehensive action plan for sustainable development from 1992 into the 21st century. We also expanded our contacts with forest scientists in eastern Europe and Russia, and we strengthened our partnerships for scientific exchange, training, and technical assistance with Mexico, Brazil, and Indonesia.

To help carry out the commitments of UNCED, we established the International Institute of Tropical Forestry in Puerto Rico. The Institute will improve the Forest Service's capabilities to support sustainable resource management in the Tropics.

I am very proud of the role the Forest Service played in getting taxol, a chemical extracted from the bark of the Pacific yew tree, approved by the Food and Drug Administration as an effective cancer-treatment drug. We played an important role during 1992 in harvesting the bark of the Pacific yew tree in partnership with the National Cancer Institute and the Bristol-Myers Squibb Company. An interim guide to the conservation of the Pacific yew was prepared, and the President signed the Pacific Yew Act to ensure efficient use and long-term conservation of this vital resource.

I look forward to 1993 as the Forest Service, working in partnership with the American people, makes progress toward implementing the ecosystem management approach on the national forests and grasslands.



F. Dale Robertson, Chief



Photo by Jim Hughes

To comply with the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), the Secretary of Agriculture submits an annual report to Congress. This annual report summarizes the performance of the Forest Service in implementing the 1990 RPA Program ("The Forest Service Program for Forest and Rangeland Resources: A Long-Term Strategic Plan") in response to congressional direction and appropriations for FY 1992. In this report, results of management, fiscal information, and highlights of Forest Service activities during FY 1992 are presented.

MAJOR PROGRAM AREAS

Forest Service activities are delivered through four programs: management of the National Forest System, State and Private Forestry assistance, Research, and International Forestry assistance.

The National Forest System includes all of the national forests and grasslands, and other lands administered by the Forest Service. These lands are managed according to the Multiple-Use Sustained-Yield Act of 1960, which emphasizes the need to manage the full range of forest resources in the interest of the public.

Technical and financial cooperation with and assistance to State and private landowners is an important component of Forest Service activities. Assistance is provided to State foresters and other State officials, other Federal, State and local agencies, American Indian tribes, and private partners and landowners.

Forest Service research programs improve the agency's ability to fulfill its multiple-use objectives and to provide technical assistance to other public and private land managers. Benefits from research extend beyond National Forest System boundaries to many segments of American society and the rest of the world.

The Forest Service shares technical land management knowledge with other countries. In partnerships with other nations, the Forest Service, as an experienced natural resource management agency, helps achieve resource conservation and sustainable development around the world. In the process, much is learned from other countries.

Figure 1 displays selected measures of agency performance for FY 1992, with FY 1991 information also displayed for comparison purposes.

CONTINUED EVOLUTION OF ECOSYSTEM MANAGEMENT AND STEWARDSHIP

As the Forest Service evolves with American society, new opportunities and emphasis areas arise. During the past 3 years, the Forest Service experimented with environmentally sensitive methods of managing the National Forest System through the New Perspectives program. In field demonstration projects, research efforts and university symposia, the Forest Service learned that ecosystem management is an effective way to manage national forests and grasslands for long-term benefit to the public and the environment.



An agency conservation educator talks about forest ecosystems with elementary school children.
Photo by Jill Bauermeister

Figure 1.

MEASURES OF PERFORMANCE

	FY 1992	FY 1991
NATIONAL FOREST SYSTEM		
Acres of land purchased.....	157,018	67,871
Acres of watershed improvements 1/.....	36,201	35,091
Acres of wildlife and fish improvements completed 1/.....	242,761	235,495
Acres of wildlife and fish inventory completed (millions) 1/.....	13.1	14.7
Acres of timber stand improvement (release/thin/etc.).....	354,800	395,800
Acres reforested (plant/seed/site prep.).....	492,000	503,200
Additional acres authorized for oil and gas leasing (millions).....	4.709	3.213
Animal unit months permitted to graze (millions).....	9.359 2/	9.554 3/
Miles of road constructed.....	1,180	1,315
Miles of road reconstructed.....	3,259	3,709
Miles of trail maintained 1/.....	69,832	65,559
Plans processed for mineral operations 1/.....	3,565	3,434
Recreation facility capacity maintained (million PAOT-days) 1/.....	135.8	134.9
Timber volume offered (billion board feet) 1/.....	5.1	6.2
Timber volume harvested (billion board feet).....	7.3	8.5
Wildlife and fish structures completed 1/.....	19,937	20,469
STATE AND PRIVATE FORESTRY		
Acres of lands treated for fuels management 1/ 4/.....	284,705	325,420
Acres of pest suppression activities completed 1/.....	1,703,850	1,500,314
Acres under stewardship management 1/.....	1,729,114	1,353,423
Acres of multiresource management under the Stewardship Incentives Program 1/.....	109,026	0
RESEARCH		
Number of extramural research grants made with appropriated dollars.....	1,064	738
Research publications by major subject area:		
Environmental.....	495	489
Insect and disease.....	403	337
Fire and atmospheric sciences.....	201	187
Forest management.....	650	574
Economics, marketing, and recreation.....	574	381
Products and engineering.....	343	288
Miscellaneous.....	7	148
Total.....	2,673	2,404
ADMINISTRATION		
Percent of total payments incurring interest penalties.....	2.1	2.0
Work force profile: 1/		
Men		
African American.....	690	667
American Indian/Alaskan Native.....	973	959
Asian/Pacific Islanders.....	243	231
Hispanic.....	1,187	1,145
White.....	18,680	18,720
Women		
African American.....	797	758
American Indian/Alaskan Native.....	693	672
Asian/Pacific Islanders.....	269	254
Hispanic.....	668	649
White.....	11,937	11,627
Total, permanent and excepted employees.....	36,137	35,682

1/ Measure is estimated or qualified.

2/ Calendar year 1991 data; FY 1992 data is presently unavailable.

3/ Calendar year 1990 data; FY 1991 data is presently unavailable.

4/ National Forest System only.

In June 1992, the Chief announced a commitment to taking an ecological approach in the management of the national forests and grasslands. Ecosystem management emphasizes the value of all forest resources and the need to manage lands holistically, rather than for individual resources. This approach provides diverse and productive habitat for wildlife and fisheries, clean water and air, recreation opportunities, forest products, and long-term ecosystem sustainability that benefits both the land and the people living on it. The ecosystem approach is a continuation of the directions set in earlier statements, particularly the 1990 RPA Program.

THE RPA STRATEGIC PLAN—FOUR STRATEGIC THEMES

The Forest Service's national strategic plan, the 1990 RPA Program, outlines the agency's long-term direction and provides general policy guidance for 5 years based on a 50-year projection. The next RPA Program will be published in 1995. The 1990 Program defined the major policy roles of the Forest Service and analyzed its relationship with and responses to contemporary issues. Four major themes emerged from these roles and issues. These themes have guided Forest Service actions and policies since 1990 and were instrumental in the evaluation of agency performance in FY 1992. These four themes are:

- Recreation, wildlife, and fisheries enhancement
- Environmentally acceptable commodity production
- Improving scientific knowledge about natural resources
- Responding to global resource issues

Recreation, Wildlife, and Fisheries Resource Enhancement

Public use of the national forests for hiking, bird watching, boating, fishing, and other purposes has increased. The value of the forests as habitat for wildlife and plants, including sensitive, threatened, and endangered species, has become more apparent. The ecosystem approach to multiple-use management encourages the protection and integration of resources such as wildlife and fisheries when managing other forest and rangeland values.



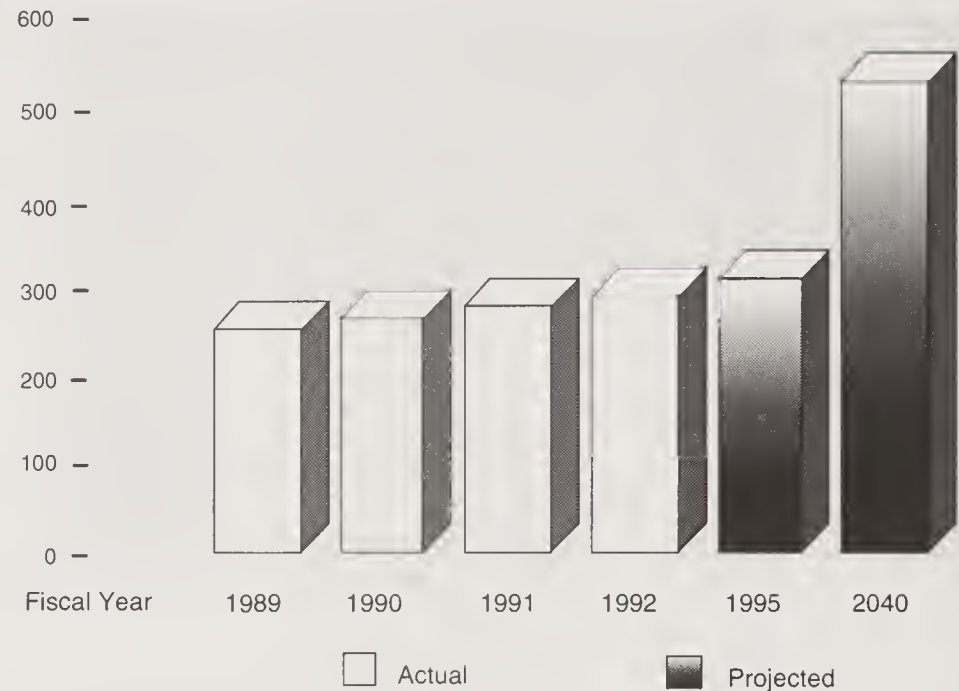
The Forest Service takes actions to protect and increase populations of endangered species, such as this black-footed ferret. Photo by Roy Murphy

As shown in figure 2, recreational use, including wildlife and fish use, of the National Forest System reached almost 288 million visitor days in FY 1992 (a visitor day equals a 12-hour stay by one or more persons), only modestly below the 1990 RPA Program projected 308 million visitor days of use by 1995. The President's recreation initiative, "America's Great Outdoors," focuses on educational and interpretive opportunities, improvement of facilities, and the establishment of special areas for environmental education. Barriers to accessibility were identified for removal so that facilities would be available to all members of the public, regardless of age or physical ability.

Figure 2.

Recreation Use, Including Wildlife and Fish

Million Recreation Visitor/Wildlife and Fish User Days
(RVD's, WFUD's)



Further emphasis on good stewardship is the Forest Service's "Leave No Trace" program. This encourages backpackers to leave the forest in the same condition in which they entered it. In FY 1992, this program was expanded to include five agencies within the Department of the Interior to help educate a wide variety of recreational users of forests in wildland use ethics.

Forest Service programs to protect and improve wildlife and fisheries habitat have expanded significantly in recent years, primarily through increased cooperation with public and private partners. As the agency continues to emphasize ecosystem management, important programs which help protect biodiversity are being implemented. One example is the "Partners in Flight" program, which focuses on neotropical migratory bird populations that breed in North America and winter in Central and South America.

The Forest Service has pursued similar efforts to preserve inland and anadromous fisheries. The "Bring Back the Natives" program, a cooperative effort with the Bureau of Land Management and the National Fish and Wildlife Foundation, strives to enhance and protect river habitats and native fish populations.

As part of the agency's ongoing commitment to improving wildlife and fish habitat, the Forest Service built 19,937 structures (e.g., waterholes, nesting boxes and platforms, fish passages, etc.) in FY 1992. Habitat improvements were made on 242,761 acres, and biological inventories were completed on 13.1 million acres. In order to provide quality recreational experiences and minimize adverse environmental impacts, 69,832 miles of trail were maintained in FY 1992.



An archaeologist finds evidence of early settlement on the Black Hills National Forest in North Dakota. Photo by E. Jaquish

Watershed improvement projects were completed on 36,201 acres of the National Forest System in FY 1992. Revegetation, soil stabilization, and channel rebuilding techniques contribute to the restoration of the watershed function, helping to ensure improved water quality and quantity for the future.

In FY 1992, almost 900 miles of waterways in the National Forest System were added to the Wild and Scenic Rivers System. These inclusions provide protection for these rivers and long-term wildlife, fish, and recreational benefits. The National Wilderness Preservation System increased substantially in FY 1992 with the addition of an estimated 426,290 acres. The Forest Service now manages 114 scenic byways, with the addition of approximately 1,100 miles to the National Scenic Byways System in FY 1992.

Environmentally Acceptable Commodity Production

Producing forest and rangeland commodities in an environmentally sensitive manner presents a continuing challenge. Forest Service research programs constantly explore new techniques to protect the environment while still fulfilling the agency's mandate of multiple-use management.

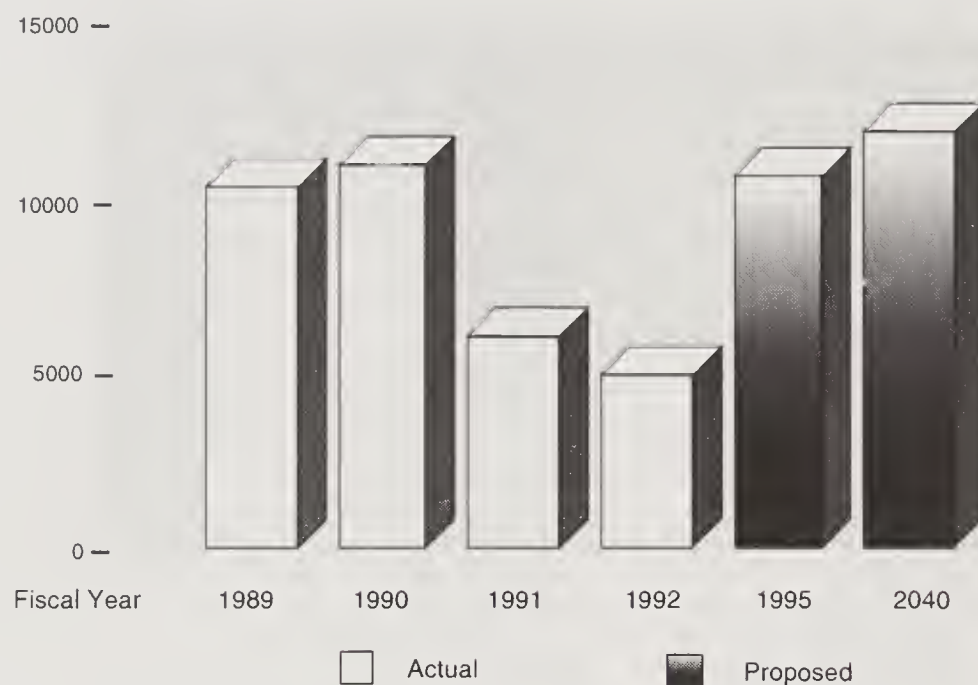
Due mainly to management decisions and legal restrictions regarding endangered species such as the northern spotted owl, the timber offered on national forests decreased by 18.3 percent (compared to FY 1991) to an estimated 5.1 billion board feet, as shown in figure 3. This represents less than half of the 10.842 billion board feet projected to be offered for sale for 1995 in the 1990 RPA program. That projection did not include adjustments for the restrictions due to the northern spotted owl, which was listed as a threatened species after the 1990 RPA Program was released.

The acres of clearcut timber harvests also decreased, in part because of the decrease in the timber volume offered but also as a result of a congressional mandate to reduce clearcutting by 25 percent between 1989 and 1995. In FY 1992, ecosystem management also contributed to an accelerated reduction in the use of clearcutting as a standard commercial timber harvesting tool. The 1990 RPA Program projected a 41.1 percent reduction in clearcutting proportional to total harvest between 1989 to 2040, and a gradual

Figure 3.

Total Timber Offered

Million Board Feet

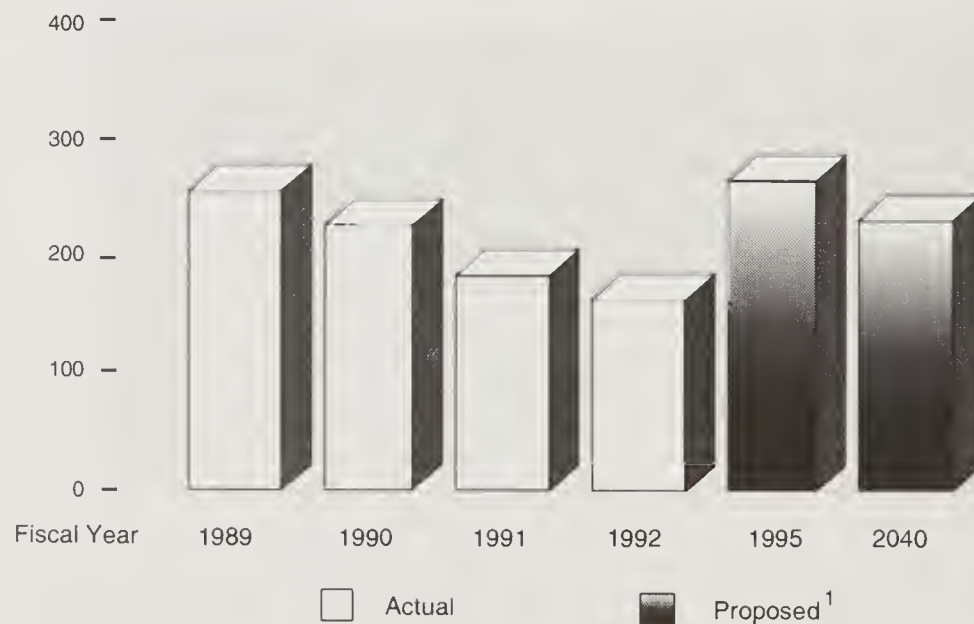


reduction in the nearer term. However, since 1990, the actual number of acres clearcut has already dropped below the level proposed for 1995 in the 1990 RPA Program. In FY 1992, clearcut harvests occurred on 162,664 acres of the National Forest System, as compared with 265,000 acres proposed for 1995 in the 1990 RPA Program (see figure 4). Several new considerations, which were not a part of the 1990 RPA Program, have influenced the reductions in clearcutting, including increased litigation and appeals on timber sales with spotted owl habitat and the implementation of the Chief's decision to reduce clearcutting as part of an ecological approach to managing the national forests. In FY 1992, clearcut acreage comprised 21.5 percent of the total acreage harvested.

Figure 4.

Clearcut Harvests

Thousand Acres



¹ Since completion of the 1990 RPA Program, changes in policy (i.e., initiation of ecosystem management) and other factors (e.g., appeals and litigation of timber sales) have resulted in less clearcut harvesting than proposed in the 1990 Program.



An example of uneven-aged management, this forest stand on the Lewis and Clark National Forest shows one alternative to clearcut harvest methods being explored through ecosystem management. Photo by Jill Bauermeister

An especially important effort in FY 1992 centered around the Pacific yew and its value as a source of taxol, the drug used in the treatment of ovarian cancer. As the medical benefit of this tree became evident, rapid action was taken to assess Pacific yew populations on national forests. A guide for the conservation and management of this tree was published, and the President signed the Pacific Yew Act for the purpose of ensuring efficient use and long-term conservation of this resource.

In addition to forest commodities, range use for livestock production poses important challenges for land stewardship. The Forest Service's "Change on the Range" program emphasizes protection and restoration of rangeland. Its focus on the long-term health of rangelands from the ecosystem perspective has led to significant improvements in range condition, including associated riparian areas.

The National Forest System contains valuable energy and mineral resources which help provide security and self-sufficiency for the United States. Operations to extract energy and mineral resources from National Forest System lands are subject to agency regulation. The Forest Service oversees such activities to minimize adverse effects on the environment and to ensure the implementation of proper reclamation measures.

In FY 1992, the Forest Service completed 59 Final Environmental Impact Statements in accordance with the National Environmental Policy Act. Timber sales accounted for the majority of the activities requiring environmental impact statements. As forest plan implementation continues, improving agency compliance with environmental regulations is a focus of Forest Service training.

Improving Scientific Knowledge About Natural Resources

Research in natural resources improves the Forest Service's ability to effectively manage forests and rangelands. As scientists collect and analyze information and apply it to land management and resource use, the agency can more effectively provide technical assistance to public and private landowners in the United States and foreign countries.

The Forest Service continuously monitors forest health, studying natural and human impacts on forest ecosystems and aiding decisionmakers in the development of management policies. Monitoring also provides the opportunity for early intervention to save forest ecosystems at risk from fire or pest infestation.

Forest Service research explores new ways of protecting forest ecosystems from damaging pests. For example, scientists have developed a spruce beetle trap which uses sex pheromones as a lure; research has also discovered which growing conditions minimize dogwood susceptibility to the disease dogwood anthracnose. With the expansion of international trade, there is increased risk of the disruption of the delicate balance of domestic ecosystems. When the invasion of Asian gypsy moths into the Pacific Northwest was discovered in 1991, the Northeastern Forest Experiment Station rapidly transferred information and technology to that region.

Continually improving scientific knowledge about natural resources and ecosystem processes enhances the ability to benefit from forest resources while mitigating adverse environmental impacts. New knowledge about natural systems will lead to new methods for timber harvesting and other activities that are more environmentally sensitive.

Forest Service research has developed new uses for forest products as well as methods of recycling wood fiber into high-quality goods to ease the strain on the Nation's capacity for waste disposal. Research into forest-based economies aids rural America by identifying potential sources of new jobs based on the sensible and sound use of forest resources. It also facilitates cooperative efforts which can result in improved infrastructure and vital services in rural areas, improving the quality of life in these communities.

In FY 1992, Forest Service research produced 2,673 publications in a variety of subject areas, including insects and diseases, fire and atmospheric sciences, forest management, economics, recreation, products, and engineering. The Forest Service made 1,064 research grants with appropriated funds in FY 1992 in support of research by institutions outside the agency.



Forest specialists review the regeneration of plants and grasses on a site that had been disturbed to lay oil pipelines. Photo by Jill Bauermeister

Responding to Global Resource Issues

With the increase in international trade and communication, and with advances in scientific knowledge regarding the global ecosystem, international cooperation is an important component of forest and rangeland resource management. From transboundary pollution to tropical deforestation, the economic and ecological impacts of events in one nation can reverberate around the globe.

In FY 1992, the issue of sustainable economic improvement in developing countries remained in the forefront of the international agenda. The year 1992 marked the first full year of the International Forestry Deputy Area in the Forest Service. The Forest Service's land management expertise puts it in a unique position to share technical expertise with land managers in the United States and other nations. Long-term research into natural resources and processes has provided valuable information which contributes to sustainable international development.

In FY 1992, the Forest Service emphasized the agency's commitment to supporting sustainable land management in all parts of the world. As part of the United States delegation to the United Nations Conference on Environment and Development (UNCED), the Forest Service took a leadership role in the development of policy for the conference. The agency participated in the negotiations leading to Agenda 21, an action plan for sustainable development leading into the 21st century, and in the Statement of Forest Principles, an international agreement on the conservation and sustainable use of forests across the globe. FY 1992 marked the decision to create the International Institute of Tropical Forestry in Puerto Rico. In line with agreements reached at UNCED, the institute will elevate the Forest Service profile in the Western Hemisphere and improve agency capabilities to support sustainable natural resource management in the Tropics. Agency employees also worked for international conservation by providing professional expertise and technical assistance to foreign countries.

A major component of the Forest Service's international forestry program is the cooperative relationship the agency maintains with other agencies such as the U.S. Agency for International Development (USAID), the Peace Corps, and the USDA Office of International Cooperation and Development (OICD). These partnerships enable the Forest Service to extend its experience and expertise to other countries by providing technical advisers to current projects.



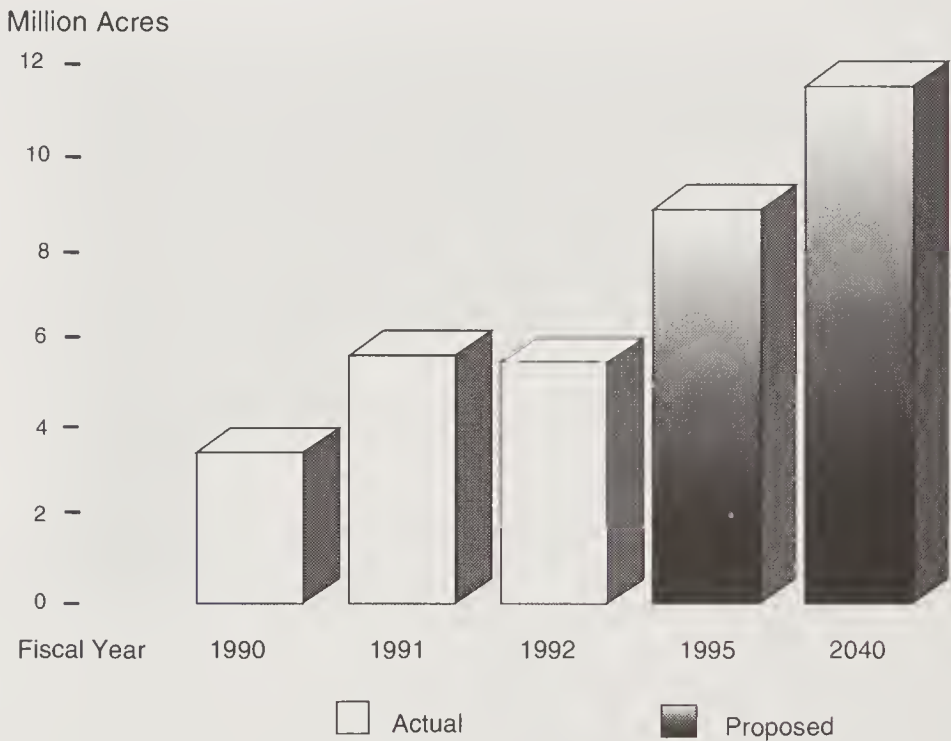
The Forest Service cooperates in USAID-funded tree planting projects. In this one, a Pakistani nursery owner displays seeds he has recently collected. Photo by Susan Huke

Forest Service involvement in international forestry also takes the form of scientific exchanges, technical transfer, and cooperative research with foreign scientists. Examples of actions taken in FY 1992 include providing technical natural resource management assistance to then-Czechoslovakia, Russia, and Israel, and assistance to several nations in fire management.

Stemming from independent efforts by field offices of the National Forest System, the Sister Forests Pilot Program to expand the involvement of field personnel in international technical exchanges started in August 1992.

Domestic programs, such as tree planting and maintenance through the America the Beautiful Act of 1990, contribute to land stewardship in the United States and may act to conserve energy and decrease the amount of carbon in the atmosphere. Figures 5 and 6 show that both the State and private forestry multiresource plans and total reforestation on nonindustrial private forest (NIPF) lands decreased somewhat since 1991. Multiresource management plans were developed for 5,509,040 acres and State and private forestry assistance contributed to the reforestation of 1,000,000 acres of NIPF lands in FY 1992.

Figure 5.
State and Private Forestry Multiresource Plans *



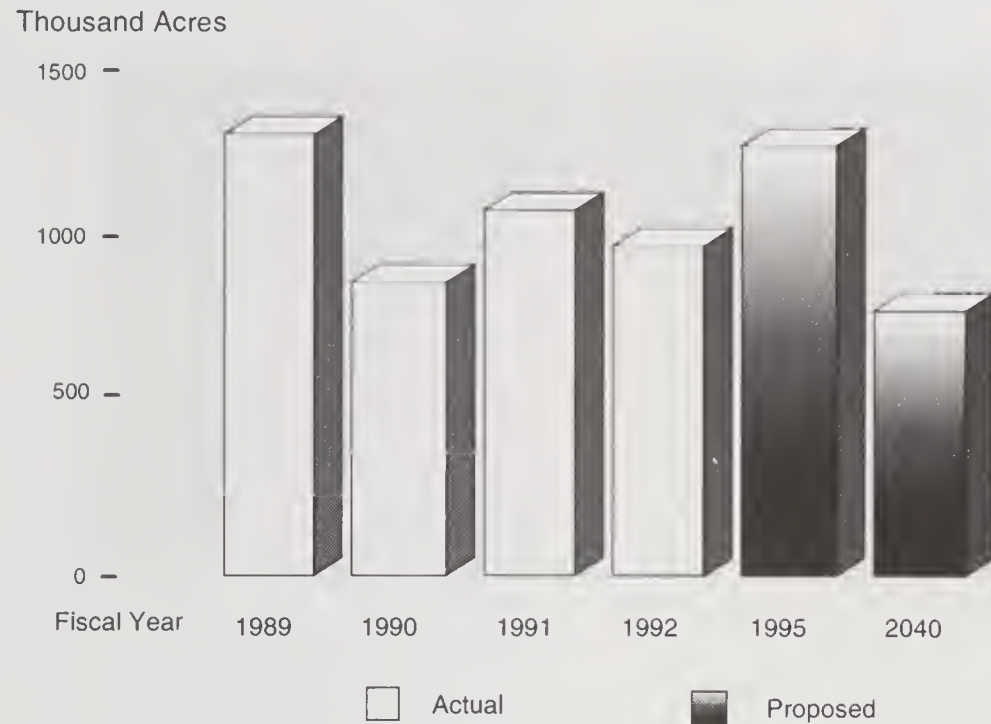
* Includes acres funded by forest resource management and stewardship.

EVOLVING ADMINISTRATIVE INITIATIVES

In addition to completing activities centered around specific natural resource program areas, the Forest Service has been working on some special projects which benefit all areas of the agency as well as its clients.

Figure 6.

Total Reforestation on Nonindustrial Private Forest (NIPF) Lands and Projected Accomplishments with S&PF Assistance



Achieving a Multicultural Organization

To develop a work force that is more representative of the public the agency serves, the Forest Service continues to work toward achieving a multicultural organization. In FY 1992, the agency continued implementation of the strategic plan for work force diversity, working toward a goal that agency employees at all levels reflect the diversity of the American population. Natural resource education for young people, urban forestry projects, and the ongoing relationship with Historically Black Colleges and Universities (HBCU's) and 1890 land-grant institutions also help involve people from ethnically diverse backgrounds in land conservation and provide opportunities for careers in forestry-related fields. In cooperation with Southern University in Baton Rouge, Louisiana, an urban forestry curriculum was created which provides further opportunities for minority students to pursue studies in natural resources. As a participant in the 1890 Institution Capacity Building Grants Program, the Forest Service served as the USDA cooperator for nine research projects.

In response to the spring 1992 riots in Los Angeles, the Forest Service mobilized its expertise and resources to provide services, employment, and hope to residents of the troubled neighborhoods. Hundreds of people worked as summer employees on nearby national forests through a program named Opportunity L.A. Regreen L.A., another Forest Service program, provided jobs and food to hundreds of residents. This matching grant program offered training in agroforestry and urban tree care. Across the country, Forest Service urban forestry programs have brought together tree care groups, local governments, and urban communities to improve neighborhoods through reforestation and tree maintenance. By learning urban forestry skills and taking responsibility for the long-term care and survival of new urban trees, residents develop a sense of pride in their communities.

The Forest Service also reached out to senior citizens through the Senior Community Service Employment program, providing jobs to those meeting eligibility requirements.



Participants in the Opportunity L.A. program improving recreation facilities on the Angeles National Forest. Photo by Larry Rana

Information Management Systems

In information management, the Forest Service continues to move towards establishing state-of-the-art systems which integrate communication, program performance, fiscal management, natural resource data and other information. The All Resources Reporting (ARR) effort provides a powerful means of linking programmatic and financial information.

Integrated geographic information systems (GIS) improve the ability of natural resource managers to make timely and informed decisions regarding extremely intricate land management issues. Using GIS, managers can analyze many variations and alternatives. By making such analysis feasible, GIS technology introduces opportunities for negotiation and compromise in the decisionmaking process. While Forest Service units across the Nation currently use this technology, linking such data nationally presents real opportunities for improving land conservation and multiple-use management.

SUMMARY

"Caring for the land and serving people" has been a guiding theme for the Forest Service for over one hundred years. The agency's approach to land stewardship and natural resource conservation has evolved over time. Implementation of the RPA Program strategic plan and continued evolution in Forest Service programs are apparent in the agency's accomplishments for FY 1992.

In FY 1992, this dedication to stewardship and conservation resulted in the adoption of ecosystem management as the guiding management approach for the sustainable use and conservation of forest and rangeland ecosystems. As one of the most experienced natural resource management organizations in the world, the Forest Service has shared professional expertise with land managers across the world, making significant contributions to sustainable international development. In FY 1992, the agency also continued its evolution into a multicultural organization in which the diversity of its employees and activities reflects the identity of its clients, the American people.



FS Photo



FS Photo

MULTIPLE-USE MANAGEMENT IN ACTION

Multiple-use management is the approach required by the laws and policies of the Nation. This approach defines the basic way the Forest Service carries out its responsibilities for meeting the wide range of values, demands, and uses that the American people place upon the 191-million-acre National Forest System. Because demands and uses vary from locale to locale, forest to forest, and region to region, the implementation of multiple-use management is very complex. That complexity is compounded by similar variations among ecosystems from place to place, and often the need to accommodate different mixes of uses within the bounds of the same type of ecosystem. This complexity increases over time as the total values, demands, and uses people place on national forests rise.

Three examples of multiple-use management on the National Forest System are included in this report and follow. These examples display some of the activities occurring on field units of the agency, and provide a meaningful, holistic way to portray the performance of the Forest Service in all dimensions of forest use and professional responsibility of the agency. This year, the examples are taken from the Uinta National Forest in the Rocky Mountains of north-central Utah; the Sawtooth National Forest in the Northern Rockies of south-central Idaho; and the Allegheny National Forest in the Appalachian hardwood area of northwestern Pennsylvania.

Each example begins with a brief description of the national forest and the two similar ecological areas that have been selected for comparison of their multiple-use management. Resource management goals and management area direction are discussed for each selected area on the national forest or grassland. Resource management goals are based on the management area allocations and prescriptions in the forest plan. These goals, along with more specific standards and guidelines, are used to analyze and design projects to implement the forest plan and to manage toward a desired future condition for each area. Under management area direction, specific management activities to accomplish forest plan direction for each area are described.

Figures 7, 8, and 9 illustrate the differences in product outputs and in uses for each of the selected areas.

Uinta National Forest

The Uinta National Forest administers 949,848 acres in north-central Utah that span towering mountain peaks (11,877 feet above sea level), sweeping valleys, and fragile deserts. The Uinta plays a vital role in providing recreational opportunities to the over 1.5 million people who live in Utah along the Wasatch Front where recreation demand is increasing. The Uinta also provides valuable watershed, range, wildlife, and timber for these same individuals.

An arterial travel route, known locally as the "Adventure Highway," traverses the forest north to south through the Diamond Fork and Strawberry Valley management areas, which were selected for comparison in this report. This is a major travel route for recreation enthusiasts who enjoy driving for pleasure and viewing scenic back country.

The Central Utah Project, a federally sponsored water project that will bring needed water from the Uinta Basin to heavily populated areas along the Wasatch Front, also affects both management areas. The major features of the project (dams, pipelines, tunnels, powerlines, heavy soil displacement, and construction activities) will affect management activities significantly.

Selected Multiple-Use Management Areas

Diamond Fork Area—The Diamond Fork management area lies mostly within the Diamond Fork tributary to the Spanish Fork River and the Utah Lake/Great Salt Lake drainage basin, which has been recognized as a priority watershed under the State of Utah Non-Point Pollution Program. Recreational opportunities include hunting, fishing, wildlife viewing, hiking, dispersed/developed camping, horseback trail use, all terrain vehicle trail bike use, cross-country skiing and snowmobiling, and "hot-potting" in geothermal hot springs.



The Diamond Fork area is home to the Rio Grande strain of wild turkey (introduced on the Uinta National Forest in 1990).

Photo by National Wildlife Federation

Within the past 30 years, livestock management has improved through reduced stocking and an intensive grazing management system. Most upland range is now in satisfactory ecological condition.

Strawberry Valley Area—The Strawberry Valley area is located in the eastern portion of the Uinta National Forest on the Strawberry River, a tributary of the Colorado River. In 1989, Congress transferred management of these lands to the Uinta National Forest. Since then, with help from local partners and volunteers, there has been ongoing restoration of streams and riparian lands.

Recreation opportunities abound in Strawberry Valley—fishing, camping, hiking, mountain biking, cross-country skiing, snowmobiling, wildlife viewing, driving for pleasure, and hunting. Strawberry Valley is also the location of a very popular "Passport in Time" project to unearth a historic military encampment.



Military re-enactors at the Strawberry Valley "Passport in Time" project. Photo by Jerry Wylie

Resource Management Goals

The following goals apply to the Diamond Fork and Strawberry Valley areas:

- Manage livestock grazing in coordination with watershed restoration projects to stabilize streambank soils.
- Manage rangeland ecosystems to obtain a desired future condition of mid- to late-seral ecological status on targeted riparian, ridgetop, and big-game winter rangelands.
- Manage timber to provide for wildlife habitat improvement, insect and disease control, while maintaining aesthetic values. Fuelwood harvesting will be a major activity.
- Provide and manage for continual, increasing demands for developed campgrounds, dispersed recreation areas, hunting and fishing opportunities, driving for pleasure, boating, and snow play.
- Coordinate with the Bureau of Reclamation during construction of facilities associated with the Central Utah Project to reduce impacts and increase benefits.
- Continue work with adjacent landowners to preserve and improve productive mule deer and elk habitat, especially winter range. Joint efforts also will be made to enhance habitat of nongame species.

- Manage roads and trails to protect them from resource damage and to meet recreation use demands.
- Utilize human resource programs to continue to meet forest goals.
- Continue work with sister agencies to enhance fish and wildlife populations, including transplants of select species for viewing as well as consumptive use.
- Manage mineral and energy demands to reduce impacts to other resources.

Management Area Direction

Diamond Fork Area

- Reduce impacts to riparian areas and siltation to streams by hardening designated dispersed recreation areas.
- Implement forest plan rangeland amendment standards and guidelines that will achieve mid- to late-seral ecological status by 1998.
- Provide additional developed camping opportunities in conjunction with the Central Utah Project.
- Improve fisheries habitat with streambank stabilization and in-stream structures.
- Improve quality of 2,000 acres of big-game winter range.
- Expand interpretive services to local and visiting publics.
- Acquire private land inholdings of critical wildlife habitat through purchase or exchange.
- Improve public access by hardening Forest roads.

Management Practices Planned

Strawberry Valley Area

- Reduce impacts to riparian areas and siltation to streams by hardening designated dispersed recreation areas.
- Implement Forest Plan Rangeland Amendment standards and guidelines that will achieve mid- to late-seral ecological status by 1998.
- Reduce sedimentation and improve wildlife habitat by implementing road closures.
- Improve fisheries habitat and control streambank degradation by stabilizing streambanks and installing gravel spawning beds.
- Improve riparian/watershed conditions on 12 miles of stream channel, and reduce sediment load in streams by correcting 10 culvert and diversion structures.
- Continue monitoring rehabilitation of vegetative conditions.

UINTA NATIONAL FOREST
Strawberry Valley and Diamond Fork Areas
Comparison of Physical Characteristics, Planned Outputs, and Uses
FY 1992

	Diamond Fork Area	Strawberry Valley Area
PHYSICAL CHARACTERISTICS		
Size of area (acres).....	115,039	150,447
Elevation (feet).....	4,800-9,500	6,500-10,200
Landtype (acres)		
Sagebrush/grass.....	23,000	53,987
Shrublands.....	57,520	10,796
Wetlands/riparian.....	5,750	7,960
Timber.....	28,750	60,704
Lake/reservoir.....	Proposed reservoir (Central Utah Project)	17,000
OUTPUTS AND USES		
Recreation visitor days		
Dispersed.....	60,000	440,000
Developed.....	30,000	2,410,000
Facilities		
Number of individual/family sites.....	47	673
Marinas/boat ramps.....	0	4
Summer homes.....	0	38
Transportation		
Miles of surfaced roads (paved and graveled).....	115	80
Miles of roads closed.....	15	42
Miles of trails.....	60	48
Timber activities		
Suitable for activities (acres).....	0	42,493
Timber harvest (MMBF).....	0	3.129
Livestock grazing		
Suitable for grazing (acres).....	51,125	117,965
Estimated grazing capacity (AUM's).....	11,616	23,248
Actual FY 1992 grazing (AUM's).....	11,090	20,752
Watershed		
Improvements (acres).....	1,500	1,625
Improvements (structures).....	0	95
Wildlife and fish management		
Fish habitat improvements (acres).....	15	300
Fish habitat improvements (structures).....	212	70
Wildlife habitat improvements (acres).....	1,350	12
Wildlife habitat improvements (structures).....	50	119
Endangered, threatened, and sensitive species		
Bald eagles.....	No	Yes
Goshawk.....	Yes	Yes
Ute's ladies tresses.....	Yes	No
MANAGEMENT PRESCRIPTIONS		
Livestock grazing emphasis (acres).....	68,263	68,395
Watershed, fisheries, wildlife (acres).....	43,776	77,931
Riparian ecosystem emphasis (acres).....	3,000	4,121
Passport-in-Time archaeological site.....	0	1
LAND ACQUISITIONS		
Acres entering National Forest System.....	2,190	57,000



Sawtooth Valley, Alturas Lake Creek area. FS Photo

- Create wildlife habitat diversity by installing 150 structures (e.g., duck ponds, stream stabilization, etc.).
- Provide visitor opportunities by constructing 40 miles of trails.
- Provide additional recreational opportunities by constructing campgrounds, boat ramps and marinas, day-use areas, winter parking areas, and trailheads.
- Provide interpretation and education with: Campfire programs, watchable wildlife (bird and fish) viewing trail and fish egg-taking station, Strawberry Valley tours, and Visitor Center general information activities.
- Manage timber to control insects and disease and improve wildlife habitat.

Sawtooth National Forest

The Sawtooth National Forest is in south-central Idaho and northern Utah. The northern half of the forest includes the Sawtooth National Recreation Area and Sawtooth Wilderness. The southern half of the forest has five separate tracts, including one in Utah. The forest consists of 2,101,442 acres. In addition, the Forest Service has certain proprietary and administrative responsibilities on 24,547 acres of private land within the national recreation area under the private land regulations promulgated by Public Law 92-400.

Selected Multiple-Use Management Areas

Alturas Lake Creek and the upper South Fork Boise River areas share a common boundary at the south end of the Sawtooth Range and the east end of the Smoky Mountains. This boundary is about 65 miles northeast of Boise, Idaho. Both areas are carved out of the granitic rock common to the Idaho Batholith. They are steep, have ragged ridges, and peaks with cliffs and slopes formed by an accumulation of rock debris. Dominant glacial ridges and lakes occur in the Alturas Lake Creek area.

Alturas Lake Creek Area—The Alturas Lake Creek area is within the Sawtooth National Recreation Area, less than 10 miles from the headwaters of the Salmon River. Alturas Lake Creek flows through dense lodgepole pine forests, stony glacial ridges, and clear glacial lakes. The area provides habitat for many species of wildlife. Big-game animals such as mule deer, elk, mountain goats, and an occasional moose can be seen. Wolverines, bears, and mountain lions also inhabit the area. A variety of birds including many kinds of ducks, songbirds, hawks, and owls occur within the different habitats. Common loons visit the lakes in the spring and fall and sandhill cranes can be seen grazing in the meadows in the summer. Alturas and Pettit Lakes and their developed campgrounds attract many visitors, as does the adjacent Sawtooth Wilderness, which provides a primitive recreation experience. Camping, backpacking, day hiking, mountain biking, horseback riding, and hunting are all popular activities in the area. Fishing and boating are common on the lakes. During the winter, cross-country skiing and snowmobiling are enjoyed. Bordering the area to the east is State Highway 75, part of the Sawtooth Scenic Byway dedicated in 1992. The Alturas Lake Creek area also provides range and timber resources.

Upper South Fork Boise River Area—The Upper South Fork Boise River area lies some 19 miles north of Fairfield, Idaho, on the Fairfield Ranger District. This area includes the headwater streams of the South Fork of the Boise River, one of Idaho's major stream courses. Because the entire area is formed from the large granitic intrusion (the Idaho Batholith), the soils are highly erosive. Subalpine-type vegetation dominates the higher ridges, with Rocky Mountain Douglas-fir growing on the northerly aspects of the slopes, generally below 9,000 feet. Lodgepole pine grows in frost pockets and canyon bottoms. The variety of vegetation creates many different habitats for a variety of wildlife. This area is known for big game, including elk, deer, bear, mountain lion, and mountain goat. The remoteness also provides habitat for the elusive wolverine. Approximately 80 percent of the area is roadless with 70 percent being managed as back country. Riding horses and motorcycles, camping and fall big-game hunting are popular dispersed recreation uses. Winter recreation is limited to helicopter skiing and a minor amount of snowmobiling because the area is inaccessible, big game winter nearby, and there is a threat of avalanches. Mining, mainly for gold, has occurred in the past in certain highly mineralized locations. Because of the rugged terrain, grazing has been limited to sheep. About 200,000 board feet of timber products, mostly firewood and post and pole material, are removed annually from roaded portions of the area.

Resource Management Goals

The following resource management goals apply to both the Upper South Fork Boise River and the Alturas Lake Creek Areas:

- Provide a variety of recreation opportunities in accordance with identified demand and maintain or improve visual quality.
- Provide off-road vehicle opportunities in areas where such use will not create unacceptable damage or conflict.
- Protect and enhance wildlife and fish habitat diversity with emphasis on anadromous fisheries and threatened and endangered species.
- Protect, manage, and improve riparian areas while conducting multiple-use activities on them.
- Improve range condition on suitable grazing lands in unsatisfactory condition.
- Manage the timber resource in a manner that is sensitive to economic efficiency while preventing or reducing serious long-lasting hazards and damage from pest organisms, utilizing principles of integrated pest management.
- Provide the opportunity for economic growth of industries and communities dependent upon forest outputs.

Management Area Direction

Alturas Lake Creek (44,400 acres)

- Manage both Federal and private lands within the Sawtooth National Recreation Area portion (37,700 acres in the SNRA and also in the other management units listed below) to ensure the preservation and protection of the natural, scenic, historic, pastoral, and fish and wildlife values and to provide for the enhancement of the associated recreational values in accordance with Public Law 92-400.
 1. Protection and conservation of the salmon and other fisheries. Recovery of the salmon species listed under the Threatened and Endangered Species Act.
 2. Conservation and development of scenic, natural, historic, pastoral, wildlife, and other values that contribute to and are available for public enjoyment; this includes the preservation of sites associated with and typifying the economic and social history of the American West.
 3. Management, utilization, and disposal of natural resources on federally owned lands (such as timber, grazing, and mineral resources) are allowed only insofar as their utilization will not substantially impair achievement of the purposes for which the recreation area was established. "Substantial impairment" is defined as that level of disturbance of the values of the SNRA which is incompatible with the standards of the General Management Plan.
- Emphasize natural processes, protect and maintain the naturally occurring physical or biological conditions in an unmodified condition for the purposes of research, observation, monitoring, and educational activities of the proposed Research Natural Area (500 acres).
- Manage the developed roaded recreation portion (4,400 acres) to provide a variety of dispersed and developed recreation activities in areas conveniently accessed by automobile and other recreational vehicles. The management area is itself the attraction. Higher levels of investment exist or are likely to develop. A rural or roaded natural recreation opportunity spectrum experience is acceptable.
- Manage the low development roaded recreation portion (16,600 acres) to provide a variety of dispersed and developed recreation activities in areas recognized for their current or potential dispersed recreation opportunities. A roaded natural or semiprimitive motorized recreation opportunity spectrum class is provided.
- Provide a visually appealing landscape as viewed from major travel route or use area for the scenic travel route (2,900 acres). Recreation and interpretive investments are provided at key interest points.
- Manage the Sawtooth Wilderness Area portion (20,000 acres) to protect and enhance values described in the Wilderness Act of 1964 and Public Law 92-400.

Figure 8.

SAWTOOTH NATIONAL FOREST
Alturas Lake Creek and South Fork Boise River Areas
Comparison of Physical Characteristics, Planned Outputs, and Uses
FY 1992

	Alturas Lake Creek Area	South Fork Boise River Area
PHYSICAL CHARACTERISTICS		
Size of area (acres).....	44,000	68,500
Elevation (feet, lowest/highest).....	6,800/10,651	5,300/10,125
Forested land (acres).....	41,000	42,000
Grassland-shrubland-wetland-rock (acres).....	3,400	26,500
OUTPUTS AND USES		
Recreation (recreation visitor days)		
Dispersed.....	9,300	32,100
Developed.....	27,920	0
Wilderness (recreation visitor days).....	4,745	0
Transportation		
Roads (miles).....	20	45
Trails (miles).....	42	74
Suitable for timber activities (acres).....	1,500	6,400
FY 1992 timber harvest (thousand board feet).....	350	200
Livestock grazing		
Estimated grazing capacity (animal unit months).....	550	1,050
Actual FY 1992 grazing (animal unit months).....	280	1,200
Threatened, endangered, and candidate species		
Chinook salmon.....	Yes	No
Sockeye salmon.....	Yes	No
Bald eagle.....	Yes	Yes
Wolverine.....	Yes	Yes
Peregrine falcon.....	Yes	Yes
Gray wolf.....	Yes	Yes
Lands activity		
Private in-holding acquired (acres).....	340	0
Scenic easements acquired (acres).....	430	0
MANAGEMENT AREAS/UNITS (acres)		
General forest.....	0	5,300
Sawtooth National Recreation Area..... (SNRA are duplicated acres)	37,700	0
Roaded recreation - developed.....	4,400	0
Roaded recreation - low development.....	16,600	6,400
Wilderness.....	20,000	0
Research Natural Area.....	500	0
Semi-primitive.....	0	48,200
Scenic travel route.....	2,900	8,600

Upper South Fork Boise River (68,500 acres)

- In the general forest portion (5,300 acres), emphasize timber and range production, the utilization of other wood products and other commodities in a manner that assures future land productivity while attempting to maintain other resource values.
- Manage the low development roaded recreation portion (6,400 acres) to provide a variety of dispersed and developed recreation activities in areas recognized for their current or potential dispersed recreation opportunities. A roaded natural or semiprimitive motorized recreation opportunity spectrum class is provided.
- Provide a variety of dispersed recreation activities in primitive, semiprimitive, and semiprimitive motorized (trails) settings in the semiprimitive portion (48,200 acres).
- Provide a visually appealing landscape as viewed from major travel route or use area for the scenic travel route (8,600 acres). Recreation and interpretive investments are provided at key interest points.

Allegheny National Forest

The Allegheny National Forest lies in four counties of northwestern Pennsylvania. Comprising more than half-a-million acres of prime hardwood timber, wildlife habitat, clear streams, and year-round recreational opportunities, it is the only national forest in Pennsylvania. Its forested tracts are interspersed with farms, hunting camps, rural villages, and bustling small towns.

The Allegheny is known for its superlative black cherry and oak veneer. However, recreation and wildlife uses, and oil and gas extraction are among the most intensive in the Eastern United States.

Selected Multiple-Use Management Areas

In a southeastern portion of the Allegheny National Forest, there are about 7,900 relatively infertile acres, representing about 2 percent of the forest. Here, soil nutrients burned away in the fires of the 1920's, as the 50-year era of extensive logging drew to a close. The fires, virtually none of which was natural, were frequently started by logging trains that snaked through the privately owned lands that now comprise the forest.

In this area of relatively flat terrain lie numerous wetlands and spring seeps. Open spaces abound, never fully regenerated because of the fires. From blackened stumps, new forests have sprung. Most of the vegetation—beech, aspen, viburnums, black cherry, and maples—grows very brushy. In addition, the Civilian Conservation Corps planted extensive areas with conifer seedlings throughout the 1930's. The area contains warm-water impoundments created for waterfowl by the Pennsylvania Game Commission.

After dividing the acreage into two areas—one about 5,300 acres, called Owls Nest, the other about 2,600, called Bull's-eye—one can see very different approaches to management.



Big Run Pond provides habitat for various forest inhabitants and migrating waterfowl. FS Photo

Owls Nest Area—The Owls Nest area emphasizes habitat for ruffed grouse and other species associated with early successional stages, and production of wood fiber (not sawtimber) in a roaded natural setting.

To accomplish this, intensive even-aged vegetation management and wildlife improvements were used to create a mosaic of small patches of different sized vegetation. For example, 20 percent of the area in the 0-9 year age class, 20 percent in the 10-19 year age class is desired. The balance (about 60 percent) will remain in the "less-than-50-year" range. In order to establish dense 10-acre patches ideal for grouse habitat and other wildlife it is necessary to retain and increase the aspen component. Well-scattered temporary openings will rarely exceed 10 acres.

Bull's-Eye Area—In the Bull's-eye area, scenic quality and dispersed recreation in a semiprimitive, motorized setting are emphasized. Species favored in this area, such as turkey, bear, and cavity-nesting birds and mammals, require mature or over-mature hardwood forests.

Figure 9.

ALLEGHENY NATIONAL FOREST
Owls Nest and Bull's-Eye Areas
Comparison of Physical Characteristics, Planned Outputs, and Uses
FY 1992

	Owls Nest Area	Bull's-Eye Area
PHYSICAL CHARACTERISTICS		
Size of area (acres).....	5,291	2,615
Elevation (feet).....	1,570	1,570
Forested land (acres).....	3,820	2,464
Openings-savannahs-wetlands (acres).....	1,471	151
OUTPUTS AND USES		
Wildlife habitat improvement (acres).....	1,649	412
Hardwood regeneration for wildlife.....	146	34
Aspen regeneration for wildlife.....	133	25
Selection for wildlife.....	50	0
Release for wildlife.....	323	68
Planting for wildlife.....	191	34
Maintenance of openings.....	27	12
Apple tree maintenance.....	209	10
Food plot construction.....	12	0
Burning and fencing.....	18	0
Fencing.....	30	24
Timber harvest (for wildlife values)		
Clearcut with residuals.....	390	30
Aspen regeneration.....	80	53
Selection.....	24	83
Thinning.....	16	39
Wildlife habitat improvement (other)		
Install wildlife structures.....	52	13
Construct potholes.....	8	5
Construct brush piles.....	82	0
Timber sale volume (MMBF).....	4.2	0.8
Designated old growth (acres).....	250	261
Roads management		
Road construction (miles).....	.8	0
Road reconstruction (miles).....	5.55	3.4
Road obliteration (miles).....	1.60	0
Dispersed recreation management		
Motorized trail.....	.5 miles	0.6
Designated pedestrian trail.....	3.8 miles	0.5
All terrain vehicle control.....	18 areas	0
All terrain vehicle parking.....	1 lot	0
Hunter parking.....	2 lots	1 planned
Erosion control.....	8 areas	Unknown
MANAGEMENT PRESCRIPTIONS		
0-9 year age class.....	20%	NA
0-19 year age class.....	40%	20-25%
Old growth habitat.....	No minimum	10%
Temporary openings (acres).....	Max 10	Max 20
Permanent openings.....	Max 3%	5-10%
Permanent opening size (acres).....	1	Less than 20
Thermal cover.....	2-5%	20%
Minimum rotation age (northern hardwoods).....	50 years	120 years
Minimum rotation age (Allegheny hardwoods).....	50 years	80 years
Minimum rotation age (Aspen).....	40 years	40 years

To accomplish management goals in the Bull's-eye area, the forest strives for a variety of age classes, including old growth habitat in about 10 percent of the area. Both even-aged and uneven-aged silvicultural systems are used. Temporary openings rarely exceed 20 acres. Timber rotation ages range up to 120 years (as opposed to 50 in the Owls Nest area).

Resource Management Goals

The Owls Nest area has the following Resource Management Goals:

- Mixed, even-aged forest with a large aspen component.
- Wildlife species emphasis on grouse as well as other early successional species.
- Roaded recreation environment, roads generally open except for seasonal closures.

The following Resource Management Goals apply to the Bull's-eye:

- Forest area managed primarily for semiprimitive motorized dispersed recreation opportunities.



Many small streams wind through the area and provide dispersed recreation opportunities. FS Photo

- Wildlife species emphasis on turkey, bear, cavity-nesting birds and mammals.
- Most roads closed except for seasonal openings.

Management Area Direction

The following management direction applies to both the Bull's-eye and the Owls Nest areas:

- Emphasize and protect special habitat inclusions.
- Trail types are motorized and pedestrian.
- Road construction is permitted only between June 16 and April 14 in order to protect fragile soils. (Roads in Owls Nest area are open from September 1 to January 31; in Bull's-eye, they are closed unless seasonally opened.)
- Road density is 1-3 miles of road per square mile, with a Traffic Service Level for new roads of "C" or "D" in Owls Nest and Level "D" in Bull's-eye (Note: Levels "C" and "D" roads are generally local, single-lane, low-standard roads, often seasonally closed. Level "D" roads are usually closed and reseeded after the resource use is completed.)

To achieve multiple-use, the following management direction was adopted for the Owl's Nest area:

- Vegetative emphasis is early successional stages and an increase in the aspen component. Wildlife management intensity is high, with emphasis on ruffed grouse and associated species. Winter thermal cover emphasis is for small mammals and birds.
- The Recreation Opportunity Spectrum (ROS) for Owls Nest is roaded natural, with low recreation management intensity.
- A primarily even-aged silvicultural system is used, and Timber Stand Improvement (TSI) is not recommended.
- Five rights-of-way over private lands were negotiated into Owls Nest, making the area accessible without building more miles of road.

The following management direction was adopted for Bull's-eye to achieve multiple-use:

- Vegetative emphasis is older, mature habitats. Wildlife management intensity here is also high, but with emphasis on turkey, bear, cavity-nesting birds, and mammals. Winter thermal cover emphasis is for deer and turkey.
- The Recreation Opportunity Spectrum is semiprimitive motorized, but it has a low recreation management intensity.
- All vegetative management treatments will be designed to benefit wildlife.

In FY 1992, the Forest Service announced a commitment to using an ecological approach in the future management of national forests and grasslands, essentially a new model for land stewardship and ecosystem research. The ecosystem management concept is based on the progress over the past 3 years in experimenting, under the New Perspectives program, with more environmentally sensitive ways to manage.

On June 5, 1992, Regional Foresters and Research Station Directors were directed to develop, with interested publics, joint strategies for implementing an ecosystem management approach. Implementation will proceed in a smooth and orderly fashion over the next 5 years and, to avoid disruption to existing programs, existing decisions and project work would not be revisited.

Ecosystem management means that an ecological approach is used to achieve multiple-use management, blending the needs of people and environmental values to provide for healthy, productive, and sustainable ecosystems that also meet human needs. It began in the 1920's with protection of primitive areas in the West and with forest restoration activities on degraded lands in the Midwestern, Southern and Eastern United States. Its basic elements are directed in the 1976 National Forest

Management Act, the RPA Program, and in functional resource initiatives such as Change on the Range, and New Forestry, leading to the development of "New Perspectives." Under this approach, more flexibility was given to field management and research professionals to practice the application of ecosystem management concepts on each national forest.

In FY 1992, each national forest was required to implement one demonstration project reflecting the themes of: stewardship of the land to sustain land communities and their resources; partnerships involving people in resolving issues that meet their needs and interest; partnerships among managers, researchers, and cooperators to refine new approaches to land management. More than 300 projects, in which teams of managers, scientists, educators, and citizens made use of the best ecological knowledge and management practices, implemented forest plans, and followed New Perspectives themes. In addition, the agency participated in or sponsored dozens of university symposia and workshops in all parts of the country. These workshops addressed issues on understanding the structure and functions of forest ecosystems, to increase and gain a better understanding of people and natural resource relationships as well as to examine traditional and potential resource options.



Integrated resource management demonstrations like the Beartree Project in Montana improve wildlife habitat through forest management activities. Photo by Jill Bauermeister

Accomplishments in FY 1992 include:

- Increased public involvement.
- Reduced use of clearcutting as a standard timber harvest practice.
- Integrated policy direction for the proposed revision of the regulations implementing the National Forest Management Act.
- Developed a nationwide on-going university colloquium program to create dialog among researchers, educators, and resource managers about mutual resource and professional challenges.
- Recognized 9 outstanding demonstration projects that addressed pressing environmental and resource issues utilizing application of the New Perspectives principles and knowledges.
- Developed visible grassroots leadership for an ecological approach to multiple-use management.
- Reorganized New Perspectives staff in the Washington Office to assume responsibility for coordination of the development and implementation of ecosystem management concepts.

Examples of field applications of New Perspectives include:

- Landscape level integration of multivalue silviculture, involving the Bitterroot National Forest, the Intermountain Station, and the University of Montana.
- Rangeland health monitoring and stocking rate guidelines, involving the Nebraska National Forest and the Rocky Mountain Forest and Range Experiment Station.
- The Bonito Project, integrated pest management on a timber sale, involving the Santa Fe National Forest and the Rocky Mountain Forest and Range Experiment Station.
- The Mill Creek Canyon partnership, involving the Wasatch-Cache National Forest and Salt Lake County, Utah.
- Applying mulch to assist reforestation, involving the McCloud Ranger District of the Shasta-Trinity National Forest and a local forest products company.
- The Cascade Center for Ecosystem Management, involving the Blue River Ranger District of the Willamette National Forest, the HJ Andrews Experimental Forest, and Oregon State University.
- New perspectives research and management, involving the Ouachita and Ozark-St. Francis National Forests, and the Southern and Southeastern Forest Experiment Stations.

- The Cooper Landing fire risk reduction project, involving the Chugach National Forest, the Pacific Northwest Research Station, the Institute of Northern Forestry, and Region 10 State and Private Forestry staff.

LAND MANAGEMENT PLANNING

The National Forest Management Act of 1976 (NFMA) required the Forest Service to develop plans for each administrative unit of the National Forest System. These integrated land and resource management plans (e.g., Forest Plans) are developed by interdisciplinary teams with public participation and review. They provide for multiple use and sustained yield of products and services from the National Forest System in accordance with the Multiple-Use Sustained-Yield Act of 1960.

Revision of 1982 Forest Planning Regulations

In 1982, the Forest Service, as required by NFMA, adopted regulations for developing and revising forest plans. In recent years, the Forest Service conducted a comprehensive review and evaluation of the National Forest System forest planning process. As a result of this critique, an Advance Notice of Proposed Rulemaking was issued in the Federal Register, February 15, 1991. The agency invited public comment in order to develop a proposed rule for implementation, amendment, and revision of forest plans; to establish the relationship between forest planning and project decisionmaking; and to make various other changes intended to simplify the planning process and respond to ideas identified during the regulatory review. Publication of the proposed rule in the Federal Register was delayed in FY 1992 because of the President's regulatory review initiative, which resulted in a moratorium on Federal regulations.

Status of Forest Plans

As of September 30, 1992, 119 forest plans were completed and are guiding management of those national forests. Only four plans remain uncompleted, all of which are in California—the Klamath, Shasta-Trinity, Mendocino, and Six Rivers National Forests. These four forests are revising their previously issued draft forest plans due to the listing of the spotted owl as a threatened species.

Seven national forests in the Rocky Mountain, Southern, and Intermountain Regions have issued notices of intent to revise their forest plans. Two others—George Washington (Virginia) and Tongass National Forests (Alaska)—have issued draft revised forest plans. Final plans for the Tongass and George Washington National Forests will be issued in FY 1993. A number of other forests engaged in pre-revision activities in FY 1992, but have not yet issued notices of intent to revise their forest plans. Additionally, approximately 119 amendments were made to forest plans on 54 national forests in FY 1992. The status of forest plans is displayed in table 5.

Implementation and Monitoring of Forest Plans

The National Forest Management Act and planning regulations require monitoring and evaluation of completed forest plans. Both monitoring and evaluation are critical to the agency's goal of ensuring that forest plans are dynamic and responsive to changing conditions. Monitoring and evaluation are used to: (1) determine whether the forest plan is being followed;

(2) determine whether resource objectives are being met; (3) assess management effects; (4) consider new information, direction, changing conditions and trends; (5) identify and document the need for change; and (6) provide a feedback mechanism for decisionmaking that keeps forest plans dynamic and responsive.

Status of Forest Plan Administrative Appeals

Administrative appeals of forest plans and amendments, as well as forest plan litigation, continued in FY 1992. Appeals were complex and were filed by individuals and groups with legal representation. During FY 1992, 121 forest plan appeals were resolved. At the end of FY 1992, 260 appeals were pending on 45 forest plans, reflecting the progress made since the end of FY 1991 when 320 appeals remained unresolved.

National Environmental Policy Act Compliance

Forest Service activities and projects subject to environmental analysis and documentation under the National Environmental Policy Act (NEPA) include: actions undertaken to implement the respective forest plans; research projects that require field studies or land disturbance; and other actions taken on state or private land but requiring agency approval or funding. The vast majority of proposals subject to NEPA are those that implement forest plans for the National Forest System.

In FY 1992, the Forest Service published Notices of Intent for the preparation of 132 Environmental Impact Statements (EIS's) for major projects. Of these projects, over 80 percent were timber sales, mining projects, habitat improvement, or recreation development. Almost 55 percent of these projects were for timber sales. The agency completed 59 Final EIS's in FY 1992, the majority (44 percent) for timber sales. The number of EIS's begun in FY 1992 is down 15 percent from the 156 EIS's started in FY 1991, but is 14 percent higher than the 114 EIS's begun in FY 1990. From 1985 through 1991, the Forest Service has steadily increased the number of EIS's prepared.

In FY 1992, the Forest Service continued its national effort to improve the quality of environmental analysis and compliance with NEPA in forest plan implementation. Training focused on implementing forest plans through the effective use of interdisciplinary teams was provided to over 2,200 agency employees, other Federal and State agency personnel, and interest groups. Additionally, in FY 1992, a second course was added for management of the forest plan implementation and the NEPA process. Instruction was given to 105 agency employees.

The Forest Service also provided international support for environmental analysis by assisting the U.S. Agency for International Development (USAID) in development of guidelines for EIS's in compliance with recent legislation regarding tropical forest management. Additionally, the Forest Service provided environmental analysis field support to USAID projects in the South Pacific and El Salvador.

LANDS

The lands program activities adjust National Forest System landownership patterns, identify necessary boundaries, provide access for public use, respond to public and private sector applications to use these Federal lands, and protect public and private interests through accurate land status and title informa-

tion. An identifiable, accessible, and manageable public land base is maintained, facilitating the stewardship of the 191-million-acre National Forest System (table 6).

Landline Location

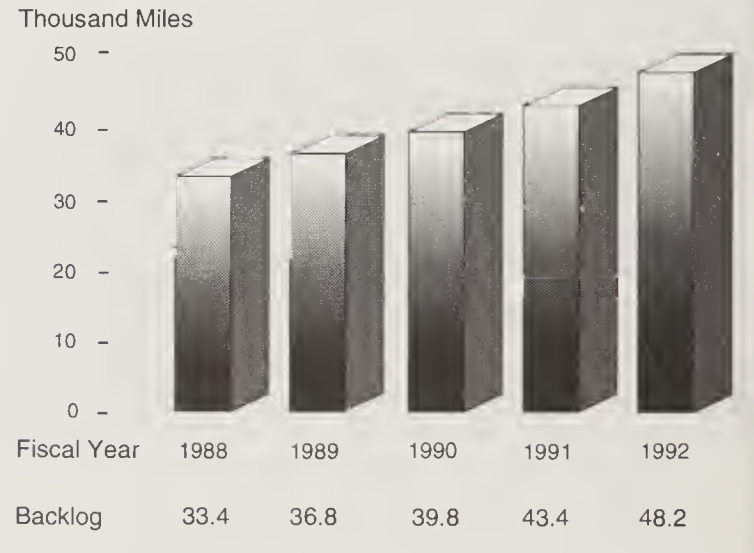
The accurate location of landlines—the legal boundaries between National Forest System lands and other ownerships—is essential for managing public lands, protecting them from encroachment, and providing resources for public use. Adjacent non-Federal lands and specially designated areas are protected from trespass. In FY 1992, the Forest Service located 4,075 miles of property boundary lines (figure 10). At the end of FY 1992, 107,300 miles, or 39 percent of the 272,409 miles of National Forest System property boundaries, were properly established (table 7).

Figure 10.
Landline Location Accomplishments



Landline maintenance is becoming a greater concern as established boundaries deteriorate with time. Experience has shown that boundaries generally need maintenance every 10 years. Figure 11 shows the magnitude of the problem.

Figure 11.
Landline Maintenance Backlog



The rapidly rising number of congressionally designated and other specially designated areas is increasing the need for surveys to locate the boundaries. As of FY 1992, the inventory of these boundary lines was over 31,000 miles.

Land Exchanges

The Forest Service exchanged 38,574 acres of the National Forest System for 69,102 acres of non-Federal land in FY 1992 (figure 12, table 8). Much of the non-Federal land acquired through land exchanges lies within classified wilderness areas, national recreation areas, wild and scenic river corridors, national trails, and other congressionally designated areas. The acquired lands include thousands of acres of critical wildlife habitat, wetland, and riparian areas. These exchanges reduced national forest property boundary lines by 773 miles, saving approximately \$4.5 million in future landline location costs—more than half of the \$8.4 million cost of the exchanges. Additional savings will also be realized from fewer trespass and rights-of-way cases and special use permits.

Figure 12.
Land Exchange Accomplishments



Small Tracts Act Parcels

A total of 85 cases were resolved in FY 1992 under the 1983 Small Tracts Act, involving sale or exchange of 271 acres of the National Forest System. In return, the United States received 113 acres of land and \$264,045. These cases included unmanageable parcels of various sizes and shapes located between mineral patents, small parcels innocently occupied, and road rights-of-way no longer needed. Since February 1984, following implementation of the Small Tracts Act, 1,399 cases, most involving encroachment, have been resolved.

Land Acquisition

In FY 1992, some 156,592 acres of high-priority purchases were completed. These Land and Water Conservation Fund acquisitions included lands in congressionally designated areas such as wildernesses, wild and scenic rivers, national scenic trails, and national recreation areas. Critical tracts were also purchased to protect threatened and endangered species habitat, as well as important wetlands and riparian areas. Many of these acquisitions also reduced long-term management costs by improving landownership patterns and reducing land use conflicts and issues.

There are a few donations of land each year that further particular objectives of various National Forest System units. In FY 1992, a 3,844-acre donation from the Richard King Mellon Foundation, assisted by The Conservation Fund, was particularly significant, protecting critical wildlife habitat on the Shoshone National Forest in Wyoming.

Rights-of-Way

The Forest Service acquired 388 rights-of-way easements involving 398 miles of system road and 13 miles of system trail in FY 1992 (figures 13 and 14). In addition, 48 miles of road and 10 miles of trail right-of-way needs were permanently resolved through Forest Service landownership adjustment activities. Through cooperative efforts with local public roads agencies, 43 miles of needed right-of-way access to National Forest System lands were also permanently resolved. In total, 234 access corridors were secured for management needs and public access to the National Forest System. This represents a 30-percent decrease from the number of rights-of-way acquired in FY 1991.

Figure 13.
Miles of Right-of-Way Acquired—Roads and Trails

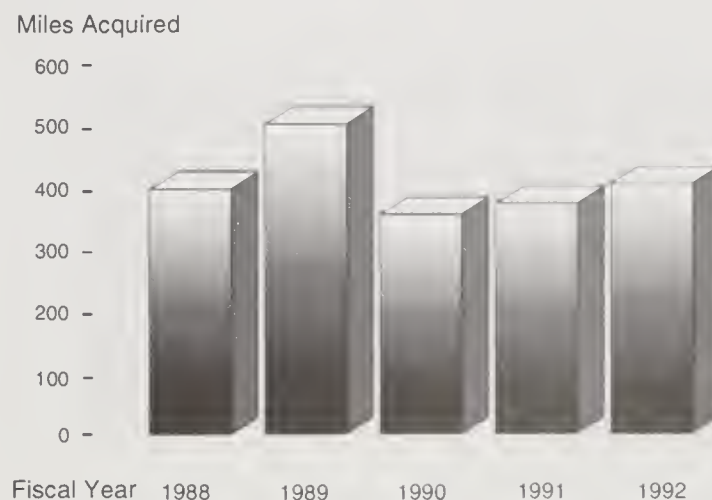
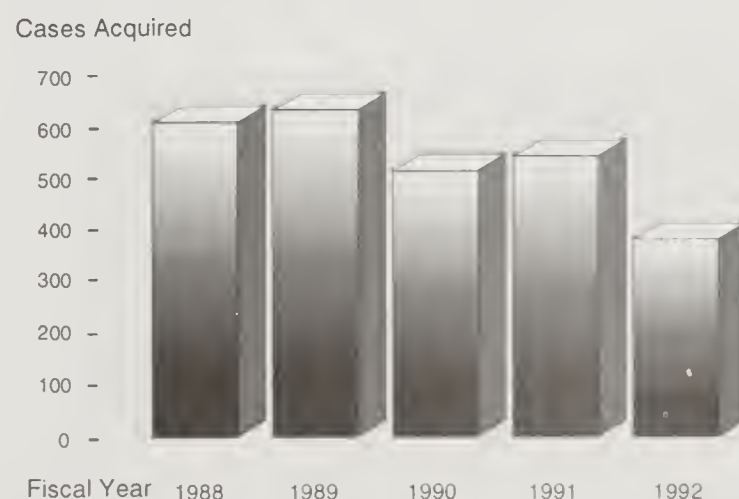


Figure 14.
Right-of-Way Acquisitions—Roads and Trails



Approximately 17.3 million acres or nearly 10 percent of National Forest System lands, primarily in the Western States, still require adequate access as indicated in a 1992 GAO report.

In FY 1992, the Forest Service and representatives from the forest industry agreed to a model Cost Share Road Maintenance Agreement. Cooperative road maintenance on jointly used roads will improve as a result of this agreement.

Special Land Uses

The administration of 51,000 nonrecreation special uses returned approximately \$6.2 million in rental fees during FY 1992. Special uses include communication sites, hydro-electric development, residences, roads and highways, power transmission lines, and various types of pipelines. Proper special use permit administration ensures protection of natural resources while supporting activities of benefit to the American public.

The Federal Communications Site Fee Advisory Committee was established in FY 1992 by the Secretaries of Agriculture and of the Interior to assist the Forest Service and the Bureau of Land Management in determining proper fees for the radio and television broadcast industry's use of Federal lands for antenna sites. Statutory authority requires the Government to receive fair market value for this use.

WILDLIFE, FISH, AND RARE PLANTS MANAGEMENT

The National Forest System provides diverse habitats for more than 3,000 species of birds, mammals, reptiles, fish, and amphibians, as well as for more than 3,000 rare plant species. The Forest Service serves as a steward for these national biological resources, managing habitats to produce wildlife and fish; protect threatened, endangered, and sensitive species; and provide recreational opportunities for hunters, anglers, amateur naturalists, photographers, and all national forest users.

In FY 1992, National Forest System lands provided an estimated 49.1 million activity days of recreational fishing, with an economic value of more than \$2 billion (figures 15 and 16).



Amphibians, like this gray tree frog, are good indicators of healthy riparian ecosystems. FS Photo



One sniff can tell a moose a lot about another. Photo by R. E. Grossman

Nearly 199 million pounds of fish from the National Forest System were commercially harvested in FY 1992, at a value of more than \$211.7 million. The National Forest System provided 26 million activity days of sport hunting, at an economic value of \$949.6 million.

Photography, bird watching, and nature study are becoming increasingly popular. In FY 1992, the National Forest System provided 30.1 million activity days of nonconsumptive use. This use is valued at approximately \$784.4 million.

The number of combined visits to fish, hunt, and view wildlife on the National Forest System is expected to increase by 183 percent in the next 50 years. These activities provide enjoyment to the forest user and employ 103,540 in jobs related to natural resource recreation and tourism goods and services, as well as generating \$2.2 billion in local community income.

Figure 15.

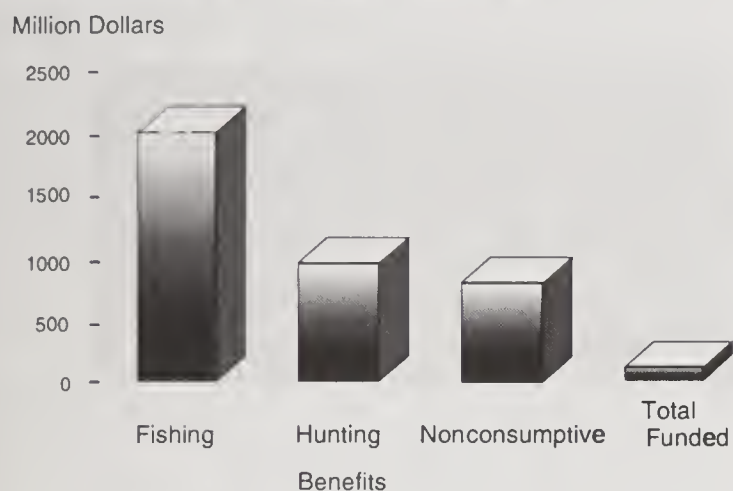
FY 1992 Wildlife and Fish Activity Days



¹ Fishing activity day averages 4.3 hours of participation. Hunting activity day averages 7.9 hours of participation. Nonconsumptive activity day averages 3.9 hours of participation.

Note: Wildlife and fish user days are included in recreation visitor day total.

Figure 16.
FY 1992 Wildlife and Fisheries Benefits and Funding



Partnerships for Wildlife, Fish, and Rare Plants

In managing habitat on the National Forest System, the Forest Service cooperates with 44 State fish and wildlife agencies that are responsible for managing animal populations and with 49 other Federal agencies and conservation groups. "Join Us" is one effort to strengthen public-private partnerships in wildlife and fisheries management.

In FY 1992, the Forest Service and its partners turned \$11.5 million of Federal funding into \$26.7 million worth of habitat improvement projects on the national forests (figure 17). Thousands of people from hundreds of sporting organizations, as well as civic groups, corporations, scout troops, government agencies on all levels, and many individuals, helped complete 2,111 habitat improvement projects for wildlife; fish; and threatened, endangered, and sensitive species.

Figure 17.
FY 1992 Wildlife Challenge Cost-Share Funding



Five-year trends in the number of partnerships display a tremendous interest and growth in the program. Partners numbered 197 in FY 1987 and expanded to 2,490 in FY 1992 (figure 18). The number of contributions has been phenomenal. More than \$3 of challenge cost-share money was contributed by partners for every \$2 of appropriated funds.

Figure 18.
FY 1992 Wildlife Challenge Cost-Share Cooperators



Get Wild!—The Forest Service Wildlife Program

The "Get Wild!" program emphasizes the maintenance of healthy ecosystems and habitat improvement for neotropical migratory birds, elk, waterfowl, wild turkey, cavity nesting species, bighorn sheep, grouse, woodcock, deer, quail, and watchable wildlife. In FY 1992, a primary program focus was migratory birds dependent on tropical ecosystems and National Forest System lands.

Within the framework of "Get Wild" the Forest Service cooperates with State and other Federal agencies, as well as working with wildlife interest groups to manage healthy ecosystems and produce high-quality wildlife habitat. Agency activities include the inventory, survey, and monitoring of wildlife habitat and populations and the protection of special habitats such as snags and riparian areas. Also, interpretive and educational opportunities are provided for forest users.

In FY 1992, the Forest Service made wildlife habitat improvements on 114,693 acres, and built 6,393 wildlife structures such as nest boxes and watering devices (table 9) with protection and maintenance funds. The following projects and activities are examples of FY 1992 program accomplishments:

- **"Partners in Flight"** focuses on neotropical migrant bird species that nest in North America and winter in the Caribbean, Central, and South America. Many of these species are declining, in part due to habitat fragmentation on the breeding grounds and loss of wintering habitat. Initiated in FY 1991, "Partners in Flight" is a cooperative effort involving the Forest Service and many State, Federal, and international agencies and conservation groups. Program activities include population management, habitat monitoring and improvement, training for resource professionals, and public education efforts. The White River National Forest sponsored a biologist employed by the Mexican government for a 6-week exchange program facilitating the exchange of information about neotropical migrant bird habitat and wildlife management in both countries.

- Active management for **Healthy Ecosystems** was undertaken on the Sitka Ranger District of the Tongass National Forest. Mixed thinnings promoted restoration of biological diversity and emulated more mature, unlogged forest conditions. Gaps, thickets, travel corridors, and varied tree spacings provide year-round habitat for many wildlife species including Sitka black-tailed deer. Trees were widely spaced in riparian areas to provide large, woody debris which improves stream habitat. In FY 1992, some 1,361 acres were treated.
- **Watchable Wildlife** is a popular recreation activity. Bald eagles on the Tonto National Forest are drawing crowds of people, who are accommodating the birds by minimizing disturbance at their nests. A major campground and viewing area will attract the attention of nearby urban residents by providing educational and recreation opportunities at Alamo Lake.
- **"Making Tracks"** research efforts on the Black Hills National Forest focused on Merriam's turkey habitat use. This study was cooperatively funded by the National Wild Turkey Federation; the results and management recommendations will be used to guide future turkey management. Habitat improvements included increasing burr oak mast production by removing ponderosa pine competition and releasing larger oak trees. Three guzzler watering devices were installed and 390 acres of habitat were improved.



Elk grazing Photo by Jill Bauermeister

- **Elk Country** improved elk habitat on the Malheur National Forest. Elk summer range habitat quality is directly influenced by open road density. Closing 63.8 miles of road and obliterating 29.1 miles reduced the road density to 1.5 miles per square mile, greatly increasing the habitat quality through access management. Partners included the Oregon Department of Fish and Wildlife, Rocky Mountain Elk Foundation, Oregon Hunters Association, Oregon Trout, and participants from the Job Training and Partnership Act program.

"Rise to the Future!"—The Forest Service's Fisheries Program

The Forest Service manages world class fisheries resources that include 2.2 million acres of lakes and reservoirs, 200,000 miles of perennial streams, and 16,500 miles of coast and shoreline. These habitats support hundreds of aquatic species important to sport, commercial, and subsistence fisheries. In addition, national forests provide habitat for more than 75 fish and other aquatic species classified as threatened or endangered under the Endangered Species Act and more than 340 additional aquatic species that have been designated as "sensitive" by the Forest Service.

"Rise to the Future!" emphasizes using partnerships to improve aquatic habitats and increase opportunities for the public to enjoy fish and other aquatic species on the national forests. Under "Rise to the Future!," the Forest Service inventories, restores, improves, and creates aquatic habitats; monitors river, stream, and lake habitats; and provides interpretive, educational, and recreational opportunities for forest visitors.

Inland Fish—In FY 1992, the Forest Service appropriation for inland fish habitat management was \$18.5 million, an \$800,000-increase over FY 1991. Funds were used to improve 15,139 acres of habitat, and construct 7,135 fish habitat structures (table 9). Two examples of FY 1992 program implementation are:

- **Bring Back The Natives**—The Forest Service, cooperating with the Bureau of Land Management, the National Fish and Wildlife Foundation, and numerous



Fisheries biologists use drills, cable, and adhesive to secure a large log in the streambed which will trap woody debris and improve habitat for fish. Photo by Tom Iraci

local partners, undertook 20 projects aimed at restoring the health of entire river systems and their native fish communities. The Marys River project in Nevada improved 176 miles of stream for the threatened Lahontan cutthroat trout and the public. During 1992, a new Master Plan was completed, watershed condition, wetland, and riparian habitats were inventoried, aerial photography for GIS analysis was completed, and baseline water quality collections were made. More than 150 volunteers planted 6,700 aspen, alder, and chokecherry seedlings along the river and its tributaries.

- **National Fishing Week**—The events and programs held during this Presidentially proclaimed week provided a unique opportunity for the public to learn more about aquatic ecology, get involved in sport fishing, and discover new opportunities to enjoy and help manage their national forests. In cooperation with thousands of national, State, and local partners, the Forest Service hosted a total of 219 events in FY 1992 reaching nearly 46,746 children and adults. Over 3,923 Forest Service employees and volunteers worked hard to make the events worthwhile. On the Gifford Pinchot National Forest, for example, 1,531 people learned about aquatic ecology, angling ethics, and water safety; participated in fishing derbies; and painted pictures with fish (i.e., the Japanese art of fish painting, Gyotaku). Special outreach efforts were made to Hispanic and African-American communities. Some fishing events included people with disabilities, students, or Big Brother/Big Sister groups.

Anadromous Fish—Funding increased to \$27.0 million in FY 1992 (\$3.4 million increase over FY 1991), reflecting the continued public concern for anadromous fish habitat conservation needs. Funds supported the improvement of 10,817 acres and construction of 3,804 structures for salmon and steelhead (table 9). Habitat restoration and improvement projects for anadromous fish included removal of barriers restricting fish movement, restoration of stream habitat degraded by past human activities, and restoration of spawning and rearing habitats.

As stewards of a majority of the remaining anadromous fish habitat in the Columbia River Basin, the Forest Service has been an active participant in the development and implementation of habitat "measures" identified in the Salmon Summit. Key accomplishments of FY 1992 include:

- Inventoried diversion structures to determine those that are migration barriers, require screens or screen improvement to allow safe fish passage on 17 national forests.
- Identified riparian habitat acquisition needs and opportunities, with at least five parcels acquired in FY 1992. Criteria for setting land acquisition priorities were modified to give deference to acquisition of parcels needed to meet Salmon Summit commitments.
- Completed approximately 2,366 miles of inventory in FY 1992, characterizing existing habitat conditions.



Yeeka Marcell hopes for a strike on Free Fishing Day, one of over 219 National Fishing Week events. Photo by J. Hughes

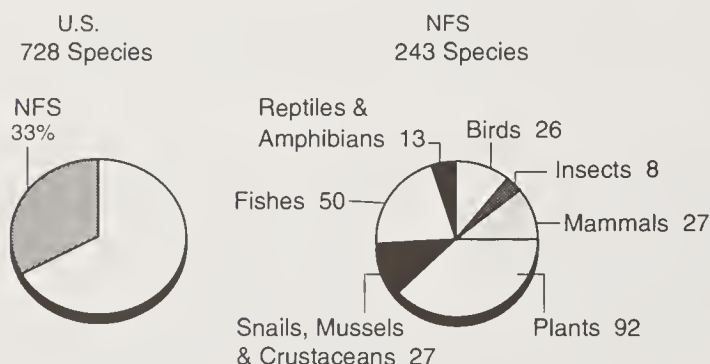
Another example of program implementation is the **Alaska Sockeye Salmon Restoration** on Redoubt Lake. This long-term cooperative project involving the Alaska Department of Fish and Game and the Southeast Alaska Regional Aquaculture Association (northern unit) has led to the return of the salmon runs. These runs have grown from a low of 8,000 fish in the 1980's to a current average of 49,000 fish. The sport and subsistence fishery have also grown proportionately to the increases, with Redoubt Lake producing 16 percent of the subsistence sockeye harvest.

Every Species Counts!—The Forest Service Threatened, Endangered, and Sensitive Species Program

The National Forest System is home to 243 plant and animal species listed as either threatened or endangered by the U.S. Fish and Wildlife Service (figure 19). This represents 33 percent of all federally listed species nationwide. Successful recovery of these species depends on collaboration with Federal and State agencies, private organizations, and individuals. In addition, the Forest Service has identified 2,200 sensitive species that are managed to prevent the need for Federal listing.

Figure 19.

Species Federally Listed as Endangered or Threatened—FY 1992



The National Forest System provides habitat for 33 percent of all federally listed species in the United States. These species include all varieties of life, from mammals to plants to mussels.

Coordination and implementation of conservation activities are part of the Threatened, Endangered, and Sensitive (TES) Species program operations, which were funded at \$28.8 million in FY 1992. The Forest Service has coordinated with the U.S. Fish and Wildlife Service on 148 recovery plans, including plans for the American peregrine falcon, grizzly bear, and northern spotted owl. Through "Every Species Counts!," the Forest Service continues to broaden the TES species program to manage, protect, and conserve plant communities and aquatic species.

Actions and plans benefiting threatened, endangered, and sensitive species mark the beginning of active implementation of an ecosystem management approach. Managing high-profile species like grizzly bear, northern spotted owl, and red-cockaded woodpecker requires integrated planning and habitat improvement to maintain the health of the entire ecosystems. Areas such as the northern Rockies, Pacific Northwest old-growth Douglas-fir forest, and Southeastern longleaf pine-wiregrass forests are analyzed at ecosystem levels. Conservation efforts for the California spotted owl in the Sierra Nevada



Juvenile northern spotted owls. Photo by Andrew Carey

range and the northern goshawk in the Southwest also focus on ecosystem management. They improve general forest health while providing sufficient protection for key species to avoid Federal listing. Many other habitat management and species management guides were finalized and implemented, enhancing the special ecosystems needed for a variety of threatened, endangered, and sensitive plants, fish, and nongame wildlife.

In FY 1992, the Forest Service improved 102,112 acres and built 2,605 structures for threatened, endangered, and sensitive species. In FY 1992, forests and regions continued to work closely with State natural heritage inventory programs to conduct surveys and develop conservation strategies for sensitive species. These strategies, aimed mostly at plants, outline actions needed to maintain population viability, and prevent the need for species to become federally listed.

Examples of FY 1992 program accomplishments include:

- **Grizzly Bear**—Western regions involved with grizzly bear management continue to implement the long-range grizzly bear recovery plan. In FY 1992, more than \$1.2 million was invested in habitat improvement and mapping, reducing human-grizzly bear conflicts, managing access into grizzly bear habitat, and providing public education materials.
- **Celebrating Wildflowers**—This new national program fosters appreciation and promotes conservation of plants. National forests held special events, provided interpretative activities, and hosted environmental education sessions. In Darrington, Washington, a quilt was created to help celebrate wildflowers; other events and activities included field trips, interpretive activities, and over 776 hours of volunteer service donated by local clubs and businesses.
- **Red-cockaded woodpecker habitat improvement** successes are obvious on the Francis Marion National Forest. Numbers of adult birds have increased steadily from 579 in 1990, 701 in 1991, to 775 in 1992. Projections are that the forest will exceed the pre-Hurricane Hugo population levels in the near future with over 2,000 birds, primarily due to management activities.



These prairie dogs may become prey for the black-footed ferret, an endangered mammal. Photo by Jill Bauermeister

- Region 2 is leading black-footed ferret recovery and management. The Nebraska National Forest has surveyed for presence of ferrets, is producing the Environmental Impact Statement, has evaluated four units suitable for ferret reintroduction, and has provided a forum for public involvement in the process.
- Active management for the smooth purple coneflower appears to be successful on the Francis Marion National Forest. Controlled burns during the dormant season have increased the number of flowering individuals from fewer than 50 to over 300.
- The National Forests in North Carolina have initiated a study focused on the effects of forest management on salamanders, such as the green salamander.
- Ten of the 18 forests in Region 5 are monitoring forest carnivores. Fisher management on the Six Rivers National Forest will use a timber sale to create or improve fisher and martin habitat. Surveys documented the occurrence of fishers, and accompanying administrative studies will reveal the effects of management activities on the 20,000-acre area.

Wildlife and Fisheries Habitat Relationship Program

Housed at Utah State University in Logan, the Forest Service's Wildlife and Fisheries Habitat Relationships Program provides information, methodology, and technology to field units to help ensure that wildlife and fish needs are adequately addressed in forest plans and forest management activities. In FY 1992, new inventory techniques for wildlife, fish, and rare plants on the National Forest System were developed. Assistance was



Systematic sampling of native plants helps botanists evaluate the health of this coastal pine ecosystem, monitor plant populations, and determine the effects of fire management. FS Photo

provided in the development of databases and geographic information systems applications related to the monitoring and inventory of habitat conditions. Inventory techniques and computer databases were disseminated to more than 170 biologists within the agency and to the Bureau of Land Management, State agencies, and foreign countries.

Work proceeded on continuing education shortcourses for agency employees with responsibilities for management of wildlife, fish, and rare plant species. The continuing education program provides both entry-level and mid-career professionals with state-of-the-art information and technical skills required of resource managers. In FY 1992, courses included basin surveys and application, program management for biologists, and managing forest structure and composition. In FY 1992, 430 biologists from the Forest Service, Bureau of Land Management, and State agencies participated in these courses.

Timber, Range, and Minerals Resource Coordination

Congress appropriated \$112.5 million for wildlife, fisheries, and rare plant management on the National Forest System in FY 1992. Of these appropriated funds, \$15.9 million were allocated to timber support to fund resource coordination on these activities. Wildlife biologists, botanists, and fisheries biologists were involved in the planning and review of approximately 19,800 timber sales. In FY 1992, biologists also assisted in the development and review of 4,000 mineral resource plans of operation. To date, 5,800 range allotment management plans requiring biological coordination have been developed or revised to meet forest plan objectives.

RECREATION, CULTURAL RESOURCES, AND WILDERNESS MANAGEMENT

Recreation

National forests offer a wide spectrum of recreation, from wilderness to urban experiences, from organized activities to individual boating and hunting, from guided auto tours along forest roads and waterways to white water rafting, from backpackers hiking on remote hiking trails to volunteering on archaeological projects.



Windsurfing, Deschutes National Forest. FS Photo

In FY 1992, the national forests hosted more than 691 million visitors. These visits equate to 288 million visitor days (a recreation visitor day is 12 visit hours, by one or more persons). This represents a 3-percent increase over FY 1991 (table 10). Figures 20 and 21 show total Forest Service recreation compared to other Federal agencies and recreation use by activity. Table 11 displays the distribution of recreation use by activity for each State. Total recreation visitor days include wildlife user days and fish user days. The 1990 RPA Program projects a 102-percent increase (base year 1990) towards 2040.

Total recreation receipts in FY 1992 were \$46.5 million, an 8-percent increase over FY 1991. Appropriations for recreation were \$216.7 million (figure 22). Fees recovered 21 percent of total recreation costs. Fees for the use of national forest campgrounds and other facilities generated \$15 million in FY 1992, compared with \$28 million in 1991. Fees for winter sports areas generated \$16.9 million, recreation residences contributed \$8.7 million, outfitters and guides paid \$2.8 million, resort revenues were \$2.3 million, and other recreation use fees were \$1 million. The total recreation special-uses fees totaled \$31.7 million in FY 1992, compared with \$28 million in FY 1991.

Interpretive Services

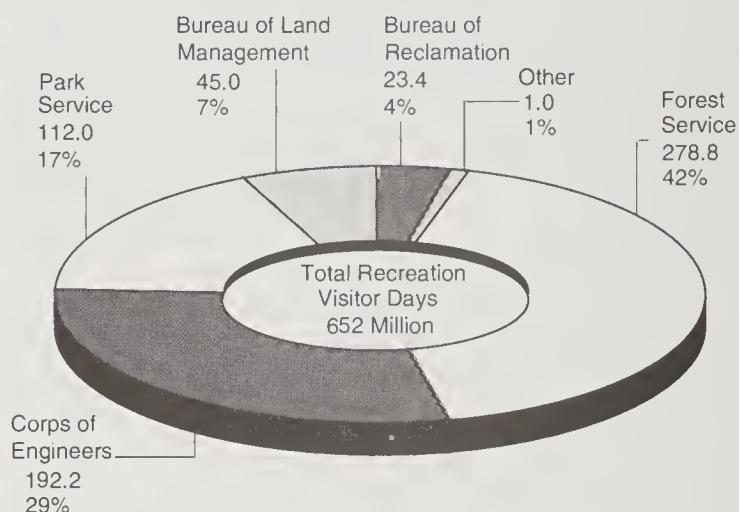
Interpretive Services is an integrated program of people, programs, and facilities that communicates natural and cultural resources and their management to visitors on the national forests. There are over 50 large visitor centers that, along with partnership staffing of other facilities, host over 6 million visitors each year.

In FY 1992, one new visitor center was dedicated and several others were under construction. Interpretive partnerships expanded to include Amtrak train staffing in the West, State ferry staffing in the Alaska Region, staffing of resorts in the Eastern Region and the West, and several information centers which were staffed by other agencies and local chambers of commerce. Cooperative interpretive partnerships resulted in very active and successful Watchable Wildlife programs. The "Passport in Time" partnership program increased forest visitors' understanding of cultural resources on the National Forest System.

Figure 20.

FY 1991 Recreation Visitor Days (RVD's) by Federal Agency*

Million RVD's

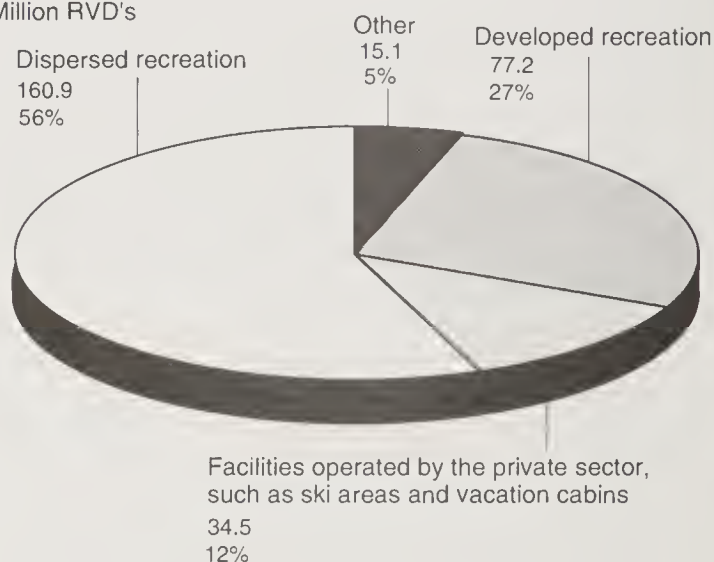


* FY 1992 agency data not yet available.

Figure 21.

FY 1992 Recreation Visitor Days (RVD's) by Activity

Million RVD's

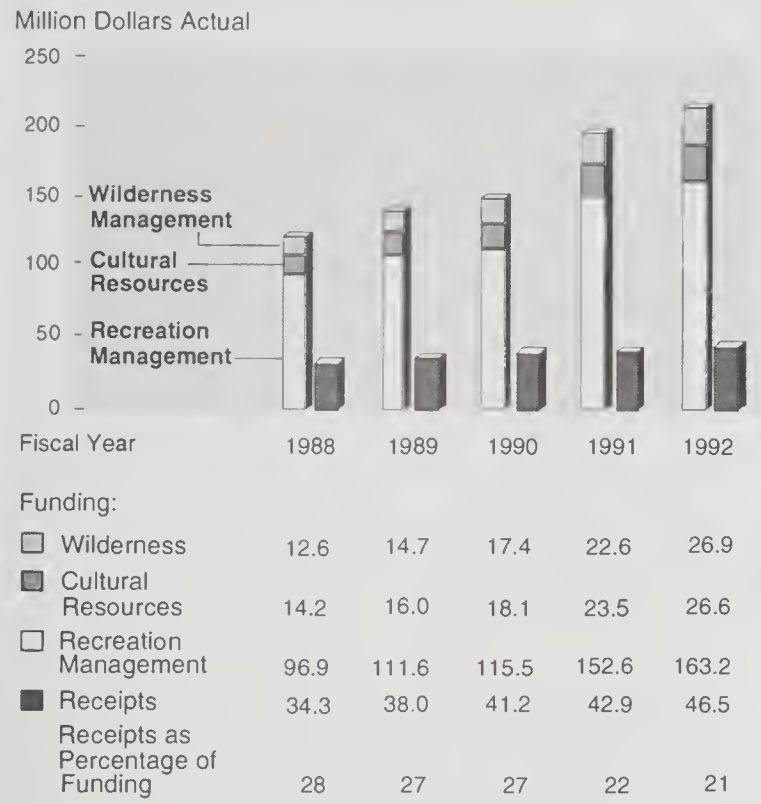


Interpretive associations continue to be extremely valuable nonprofit partners that support the Forest Service's interpretive program. These education and interpretive partners produce and sell publications about the national forests and sell them at Forest Service visitor centers and offices. Contributions to the Forest Service from all interpretive associations exceeded \$2 million.

Challenge Cost-Share and Volunteers

The Forest Service and its partners in the total challenge cost-share program contributed time and labor valued at \$39.4 million on 1,773 projects (figure 23). In recreation use challenge cost-share projects, the Forest Service and its partners cooperatively accomplish work such as natural resources education, improved campground access for Americans with disabilities, development of interpretive sites, investigating archaeological sites, and numerous publications. The challenge

Figure 22.
Recreation—Funding and Receipts



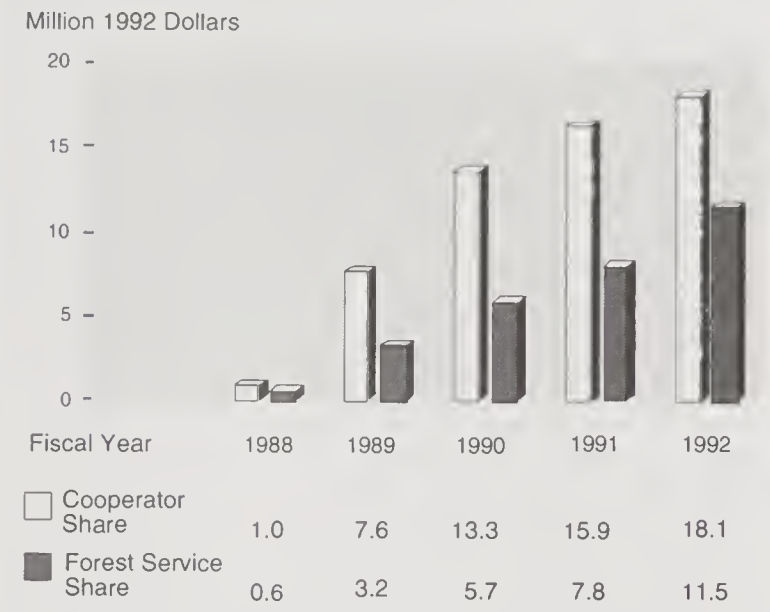
cost-share program for recreation use contributed a value of \$29.6 million on 1,481 projects (figure 24).

Volunteers and participants in the Touch America Project contributed work valued at \$28.1 million on recreation-related projects. This represents 68 percent of the total work contributed. Figure 24 displays the cost-share and other volunteer programs' contributions.

Trends

The nature of recreation has changed in the last decade. Providing camping and hiking facilities is no longer enough. The public wants educational opportunities, interpretation of natural and cultural resources, special areas to learn about the environment, and most importantly, involvement in caring for

Figure 23.
Recreation Use—Challenge Cost-Share Funding



the land. The visitors themselves are also changing to include more senior citizens, Americans with disabilities, and people of diverse ethnic backgrounds.

The President's recreation initiative, "America's Great Outdoors," concentrates on interpretation/education services, facilities improvement, and establishment and maintenance of special areas, all of which allow the Forest Service to respond to these trends and to enhance recreation resources in accordance with the 1990 RPA program.

During FY 1992, the Forest Service continued to improve access to recreation programs, facilities, and services for all visitors, including those with physical, sensory, and cognitive disabilities. New interpretive programs were initiated to improve access to and understanding of cultural resources. Opportunities were explored for new partnerships in environmental interpretive programs and interagency partnerships to encourage both domestic and international tourism on Federal lands.

Figure 24.
VALUE OF WORK CONTRIBUTED
FY 1992

	Project Number	Amount of FS Funding	Amount of Partner Contribution
<i>1,000 dollars</i>			
Challenge Cost-Share - Recreation Management	1118	9,369	14,996
Challenge Cost-Share - Cultural Resources	198	1,390	2,037
Challenge Cost-Share - Wilderness	165	722	1,124
Challenge Cost-Share - Trail Maintenance	104	855	1,073
Challenge Cost-Share - Recreation/Trail Construction	188	3,160	4,651
Volunteer & Touch America Project	N/A 1/	N/A	28,143
		Total	67,520

1/ Not available.



Volunteer helping hikers with directions on the Tyger Ranger District, Sumter National Forest, South Carolina. Photo by Barry Nerhr

In order to serve all visitors without segregating the elderly and those with disabilities, the Forest Service has embarked on an interagency effort to develop state-of-the-art access standards for outdoor recreation facilities, programs, and services. Through the America's Great Outdoors recreation initiative, the agency evaluates recreation facilities to identify and remove accessibility barriers.

During FY 1992, over 900 volunteers contributed over 71,000 hours on "Passport In Time" projects across the national forests, including archaeological excavation, historic reconstruction, oral history collection, and surveys. "Passport In Time" broadens the scope of environmental education and meets a growing demand for recreation that actively involves visitors in caring for the resources.

The Forest Service is actively involved in developing tourism partnerships with local, regional, and State organizations in order to assist rural communities in diversifying and strengthening their economic base. This activity recognizes the important tourism role the national forests fill as attractions, as a scenic backdrop to many communities, and as a supplier of tourism facilities such as campgrounds, trails, resorts, ski areas, and trails. In FY 1992, the Forest Service conducted an interagency conference on tourism which provided tourism training to managers from the major Federal land managing agencies. A memorandum of understanding was signed by the Forest Service, Fish and Wildlife Service, Bureau of Land Management, National Park Service, Bureau of Reclamation, Corps of Engineers, and the Travel and Tourism Administration to form a basis for working together in marketing tourism on the Federal lands both domestically and internationally.

Trails

Cross-country skiers, hikers, horseback riders, all-terrain vehicle riders, motorcyclists, snowmobilers, bicyclists, and recreationists with disabilities use the national forest trail system. The total trail system now has 120,284 miles. In FY 1992, the Forest Service constructed or reconstructed 1,976 miles of trails. An additional 128 miles were constructed through contributed funds in challenge cost-share projects and by volunteers. Most work involved the reconstruction of existing trails.

The "Leave No Trace" program is a user ethics program initiated by the Forest Service primarily for wilderness backpackers. In FY 1992, the Forest Service joined with Department of the Interior agencies—the Bureau of Land Management, National Park Service, Bureau of Reclamation, and Fish and Wildlife Service—and the Take Pride in America campaign to broaden the scope of the "Leave No Trace" program. The agencies are developing a memorandum of understanding with the National Outdoor Leadership School to promote responsible use of wildlands by visitors participating in all nonmotorized recreational activities. The memorandum of understanding will propagate the "Leave No Trace" ethic among agency employees and public lands visitors, increase awareness of outdoor ethics among urban populations, and promote training and research on effective low-impact practices.

Scenic Byways Program

Driving for pleasure and viewing scenery accounts for more than 34 percent of total recreation use on national forests. The National Scenic Byways program identifies travel routes that traverse scenic corridors with outstanding aesthetic, cultural, or historical values. These byways offer motorists a spectrum of unique forest settings ranging from dense rain forests to northern hardwoods to mountain tundra and alpine forests.

The Forest Service designated its first national forest scenic byway in 1988. The program has grown substantially to 114 national scenic byways, covering nearly 6,000 miles in 33 States; in FY 1992, 14 new byways were added to the program.

Recreation Facility Management

Developed recreation sites in the National Forest System experienced 77.2 million recreation visitor days of use in FY 1992, compared with 76.6 million in FY 1991. Over 18,000 facilities, including campgrounds, trailheads, boat ramps, picnic areas, visitor information centers, as well as privately owned facilities on national forest land such as recreation residences and ski resorts, can accommodate 1.8 million people at one time (PAOT).

Wild and Scenic Rivers

The National Wild and Scenic Rivers System now totals 10,410 miles, of which 4,316 miles are managed by the Forest Service. Of the 153 rivers or river segments in the system nationwide, 96 are managed by the Forest Service.

In FY 1992, the 102nd Congress added 26 rivers totaling 899.1 miles on the National Forest System in the States of Pennsylvania, Michigan, Arkansas, and California. Recommendations for designation of an additional 121 National Forest System rivers have resulted from forest planning and special river



Improved access to the National Forest System enables the physically challenged to enjoy recreation areas. FS Photo

studies. An additional 524 rivers have been identified as having outstanding resource values and free-flowing characteristics, making them eligible for the Wild and Scenic River System; studies are presently in progress on some of these rivers.

Special Recreation Areas

The National Forest System contains 42 legislatively established special recreation areas totaling more than 7 million acres: 17 national recreation areas, 6 national scenic areas, 4 national monuments, and 15 other areas. Two areas were added in FY 1992: Springer Mountain National Recreation Area and Coosa Bald National Scenic Area.

Wilderness

Recreation in wilderness accounted for 13.3 million recreation visitor days in FY 1992. The Forest Service manages 387 units of the National Wilderness Preservation System in 36 States. This includes 34 million acres or approximately 18 percent of the National Forest System. Forest Service-managed wilderness is 74 percent of the National Wilderness Preservation System in the lower 48 States, and 36 percent of the entire system including Alaska wilderness. On December 11, 1991, the Chattahoochee Forest Protection Act was passed and signed into law by the President, adding 25,480 National Forest System acres in Georgia to the National Wilderness Preservation System. On June 19, 1992, the President signed the Los Padres Condor Range and River Protection Act, adding another 400,450 National Forest System acres in California to the system. The Forest Service was actively involved in Congressional consideration of additional wilderness in North Carolina, Montana, and Colorado but legislation designating more wilderness in these three States failed to pass the 102nd Congress. As management regimes are being further refined for the wildernesses administered by the Forest Service, the role of wilderness is being recognized as a key component of the ecosystems of which each wilderness is a part.

Cultural Resources Management

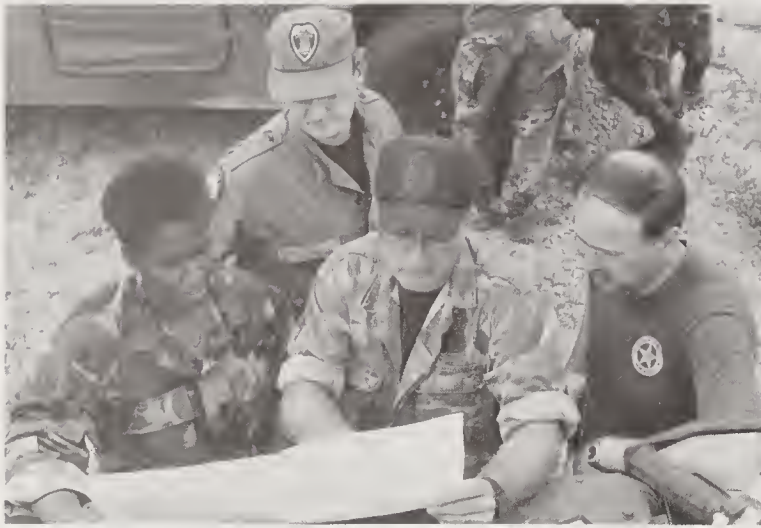
During FY 1992, the "Windows On The Past" interpretive initiative greatly increased public participation and use of the cultural resources on national forests. Through a "Windows On The Past" program called "Passport in Time," 911 volunteers contributed over 40,000 hours on 83 projects on 65 forests in 24 States, including archaeological excavation, historic reconstruction, oral history collection, and surveys. Over 2 million visitors attended cultural resource celebrations. "Windows On The Past" programs contribute directly to the 1992 RPA targets of enhanced recreation services and improved scientific knowledge about the natural and cultural resources.

Continued inventory and protection of significant sites build our knowledge of the cultural resources on Federal lands. During FY 1992, surveys were completed on 1.2 million acres and over 12,000 historic or prehistoric properties were identified. Of this number, approximately 9,500 properties were determined significant and 68 were submitted to the National Register Of Historic Places.

Ecosystem management has made it possible to prioritize inventory for cultural resources within broader areas, thus adding significantly to efficiency and accuracy in determining resource distribution and density.

LAW ENFORCEMENT

The Forest Service law enforcement objective is to protect National Forest System visitors and their property, agency employees, natural resources within the forests, and Federal property. Increasing numbers of individuals are using the forests for illegal activities which include vandalism, archaeological resource violations, timber theft, wildland arson, and the cultivation and manufacture of illegal drugs. During FY 1992, approximately 170 special agents and 600 uniformed law enforcement officers performed investigation and enforcement activities unique to the National Forest System and its resources.



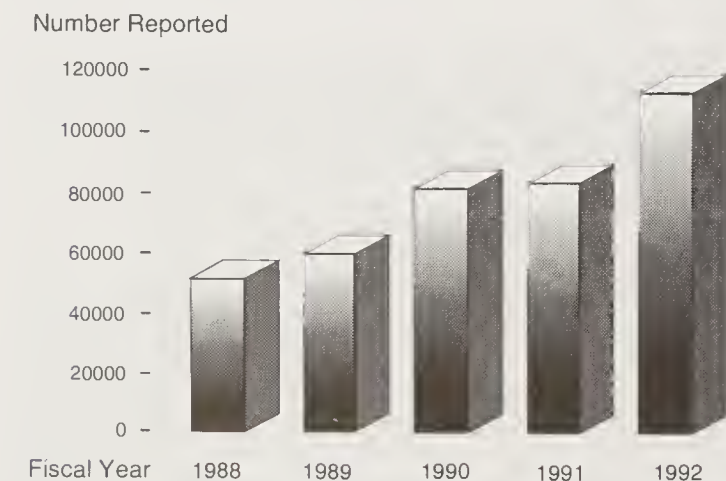
Cooperative drug control efforts on the Daniel Boone National Forest, Kentucky. Photo by Wendy Haney

During FY 1992, the agency sent approximately 80 Forest Service employees to basic law enforcement training at the Federal Law Enforcement Training Center in Glynco, GA. In FY 1992, the agency offered advanced law enforcement training programs to over 330 employees. These programs were also sponsored by the Glynco center. Also, 96 employees attended Law Enforcement for Managers (LEM) class in FY 1992. In addition to training its own law enforcement personnel, Forest Service law enforcement instructors trained over 377 State and local law enforcement personnel in such areas as wildfire investigation and technical investigative equipment programs.

During FY 1992, there were over 112,000 reported incidents or violations of Federal laws and regulations on the National Forest System. These incidents and violations resulted in many millions of dollars in damages and losses to National Forest System property and resources. Violations included timber theft, arson, theft of archaeological artifacts, vehicle-use prohibitions, occupancy and use violations, and health and safety hazards. As displayed in figure 25, the number of incidents and violations reported has increased in recent years.

Figure 25.

Law Enforcement Incidents and Violations Reported



In FY 1992, direct line-item funding from Congress in the area of cooperative law enforcement provided funding for agreements that allowed the Forest Service to cooperate with State and local law enforcement agencies and with other Federal agencies. Approximately 400 law enforcement agreements provided reimbursement to cooperating State and local law enforcement agencies for these additional services. Cooperative law enforcement funding was also used for about 250 drug control agreements between the Forest Service, State and local law enforcement agencies, and other Federal agencies or task forces to cooperatively work in eliminating illegal drug activities on the National Forest System.

Forest Service drug control efforts are focused on the detection, apprehension, and prosecution of persons responsible for illegal drug activities on the National Forest System. During calendar year 1992, nearly 575,300 cannabis plants were eradicated from 8,548 sites on the National Forest System. Some 991 individuals were arrested for illicit controlled-substance production and distribution on the National Forest System. Drug enforcement efforts resulted in the seizure of several million dollars' worth of assets and the destruction of several billion dollars' worth of drugs. In FY 1992, the agency continued to place special emphasis of drug control on the U.S./Mexico border and some areas in the Southern States.

FIRE AND AVIATION MANAGEMENT

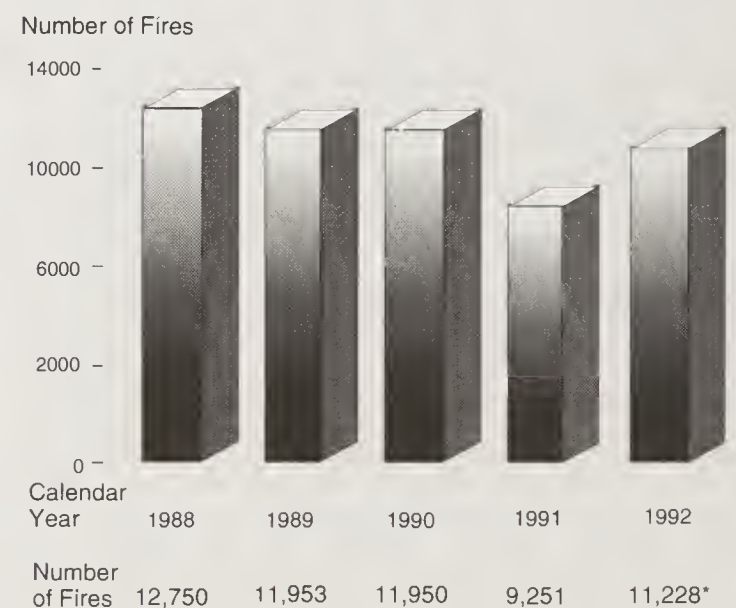
Fire and aviation management activities on the National Forest System are under the leadership of the State and Private Forestry branch of the Forest Service, and are directly coordinated with cooperative fire protection activities.

Wildfires on the National Forest System

In FY 1992, Forest Service firefighting resources fought 11,228 fires that burned over 530,000 acres on the National Forest System (figures 26 and 27), and provided firefighting assistance to other Federal and State organizations through interagency agreements. Twenty-six large fires exceeded local management capability, requiring National Incident

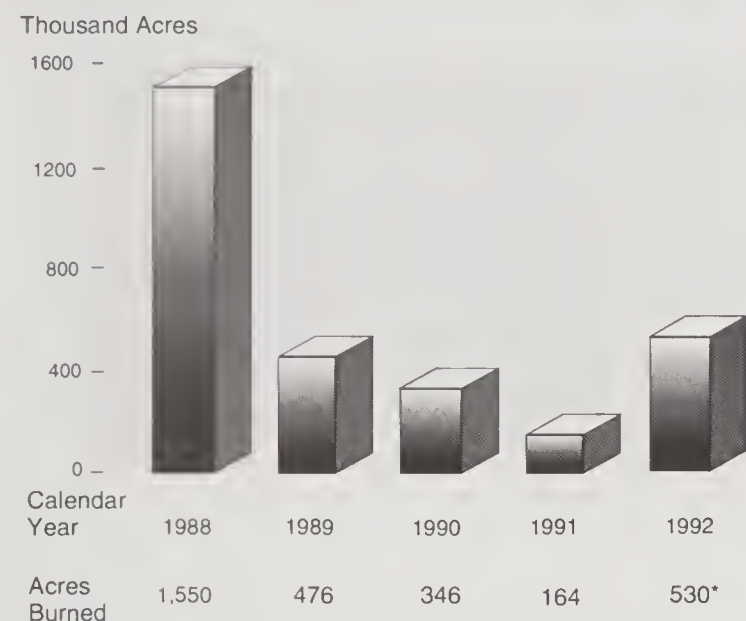
Figure 26.

Number of Fires on the National Forest System



* Preliminary figure.

Figure 27.
Acres Burned by Wildfire on the National Forest System



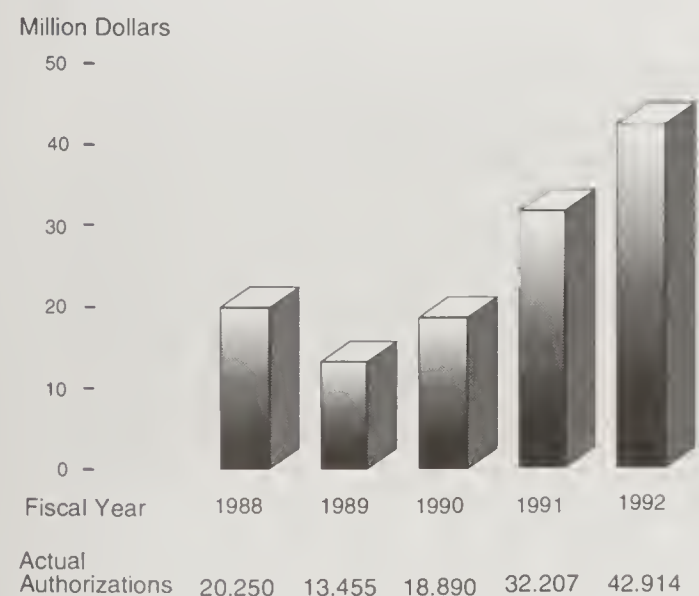
* Preliminary figure.

Management Teams. The relatively low number of national mobilizations during a period of drought is the result of a high level of preparedness and response to the predicted severe fire season. Fire severity funding, early planning efforts, and cooperation with other agencies provided the resources necessary to respond to emergency situations as they occurred.

For the sixth consecutive year, a severe drought dominated much of the Western United States. Congressional approval for severity funding allowed the agency to increase readiness levels quickly as drought conditions worsened and the potential for severe wildfires rose. The Forest Service authorized approximately \$42.9 million (figure 28) in severity funding.

Critical drought conditions developed by late July throughout much of the West. A National Critical Resources Preparedness Action Plan was developed that strengthened initial and

Figure 28.
Severity Authorizations



Air tanker dropping fire retardant. Photo by Bob Ruiz

extended attack suppression capabilities among national resources. Several large fires occurred in Oregon, California, and Idaho, but initial and extended attack forces were successful in the early control of many other threatening fires elsewhere.

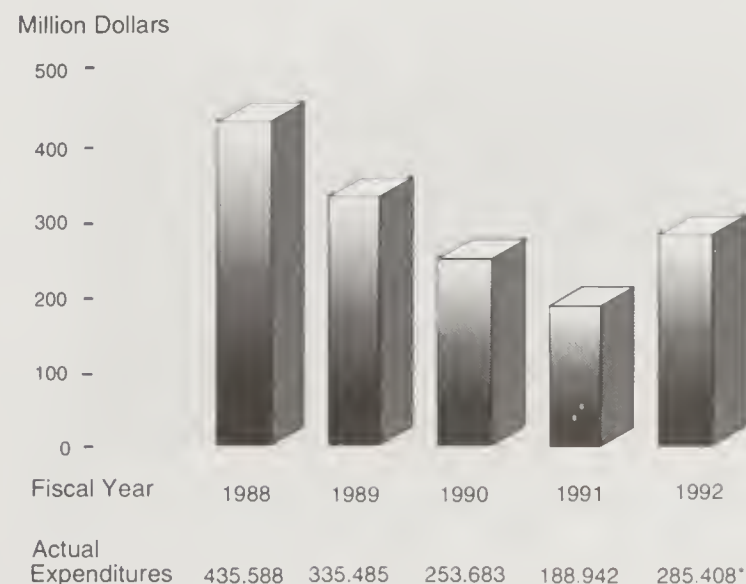
For FY 1992, the Forest Service expended an estimated \$285 million (figure 29) in emergency firefighting funds. For wildfire suppression, the Boise Interagency Fire Center dispatched 3,413 overhead personnel and 763 crews (20 persons each) to support local suppression efforts.

Presuppression

In FY 1992, the Forest Service presuppression program operated on a \$187 million forest fire presuppression budget to maintain a protection organization consisting of lookouts, aerial detection and fire prevention patrols, engines, crews, helicopters, dispatchers, fire management overhead, and fire fighting equipment. Eighteen national incident management teams and eight major fire caches were maintained.

All national forests and grasslands used the National Fire Management Analysis System to determine their appropriate level of protection based on available funding. In addition to

Figure 29.
Fighting Forest Fires—Emergency Expenditures*



*Includes severity authorizations (preliminary figure).

regularly funded Forest Service personnel, emergency fire crews were hired through local employment offices and trained for use on a call-when-needed basis, helping local economies and providing opportunities for the unemployed while minimizing the cost to government.

The National Advanced Resource Technology Center trained personnel for National Incident Management Teams and other fire and aviation-related duties. The center hosted 11 advanced fire management courses and trained approximately 700 students from a variety of government agencies. The center also helped produce international fire technology transfer courses for Mexico that centered on fire suppression and prescribed burning.

The Forest Service continued a close working relationship with the military for fire support. Eight modular airborne firefighting systems were signed up under cooperative agreement with National Guard units prior to the fire season. These C-130 aircraft are specially modified to deliver retardant.

The agency is continuing to develop several interagency computer systems to increase efficiency in the fire organization. Among these systems are the National Automated Cache System, the Weather Information Management System, and FireFly, an infra-red fire scanning system.

Wildfire Prevention

In FY 1992, the Forest Service improved fire prevention efforts through several steps, including increased emphasis on interagency partnerships and projects. Planning was initiated for the celebration of Smokey Bear's fiftieth anniversary as the agency's firefighting symbol, to be celebrated from October 1993 through August 1994. The cooperative forest fire prevention program produced an extensive, highly recognized public advertising campaign. The network of local agencies and cooperators developed by the cooperative forest fire prevention program was streamlined to create distribution channels for local fire organizations.

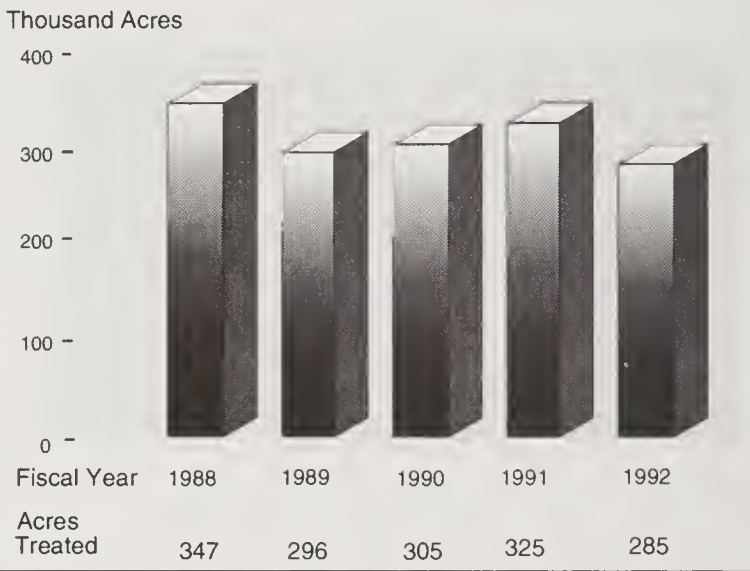
Wildland/Urban Fire Prevention/Protection

Over the past 30 years, increasing numbers of primary and secondary homes have been constructed in the wooded portions of the country, causing growing fire protection concerns in the wildland/urban interface area. In 1986, the Forest Service joined with the U.S. Fire Administration in the Wildland Urban Interface Fire Protection initiative. Coordinated by the Forest Service, the initiative is now supported by the Bureau of Land Management, the National Park Service, and the National Association of State Foresters. In FY 1992, efforts were undertaken to reach city and county planners, developers, architects, and landscape designers as well as insurance companies with information on wildfire safety.

Fuels Management

Fuel loadings are treated in order to reduce fire hazard. Wildfires that occur in treated areas are generally easier to control. Fuel treatment translates into smaller, less costly, and less damaging fires. Fuel loadings increase as a result of timber harvest, other management activities, and natural processes.

Figure 30.
**Acres of Fuels Treatment Accomplished—
National Forest System**



In FY 1992, some 284,705 acres of National Forest System lands were treated, less than in previous years (figure 30). The reduction was primarily due to extended drought which precluded safe prescribed burning through much of the season. Nevertheless, the Forest Service target for natural fuel abatement was fully accomplished.

**Fire in Support of an Ecological Approach to
Forest Management**

Fire is a fundamental ecological process in many vegetative types throughout North America and plays a vital role in sustaining healthy, productive conditions in fire-adapted systems.

An important objective during FY 1992 was the development of a long-term strategy that integrated fire-related considerations into planning processes and implementation schedules supporting ecosystem management concepts. A staffing group, comprised of internal and external subject-matter experts and representatives from research and academia, described the task of fire management in incorporating fire ecology principles and outlining methods for project-level planning in support of an ecological approach to multiple-use management. As ecological principles become integrated into the next generation of forest plans, fire-related considerations are expected to require additional analysis.

FOREST PEST MANAGEMENT

Forest Pest Management activities on the National Forest System are under the leadership of the State and Private Forestry branch of the Forest Service and are directly coordinated with cooperative pest management activities to provide protection from insects and diseases on all Federal and non-Federal lands. Surveys, evaluations, and prevention and suppression activity on the National Forest System are described below. Pest management activities that benefit other land areas are described on page 64 under State and Private Forestry accomplishments.

Surveys and Technical Assistance

Aerial and ground surveys detected and evaluated vegetation damage or pest populations on 124 million acres of the National Forest System. Survey findings, along with recommendations and advice about suppression needs and available alternatives, were provided to the managers of affected lands.

Pest Outbreak Prevention and Suppression

Using the bacterial insecticide *Bacillus thuringiensis* (*Bt*), the Forest Service conducted gypsy moth, *Lymantria dispar*, suppression projects totaling about 27,100 acres, on the Allegheny National Forest (Pennsylvania, 23,300 acres), Huron-Manistee National Forest (Michigan, 2,300 acres), and George Washington National Forest (Virginia, 1,500 acres).

A gypsy moth eradication project totaling 9,100 acres was completed in Utah on the Uinta and Wasatch-Cache National Forests using *Bt*, in conjunction with the treatment of 6,600 acres of State and private lands.

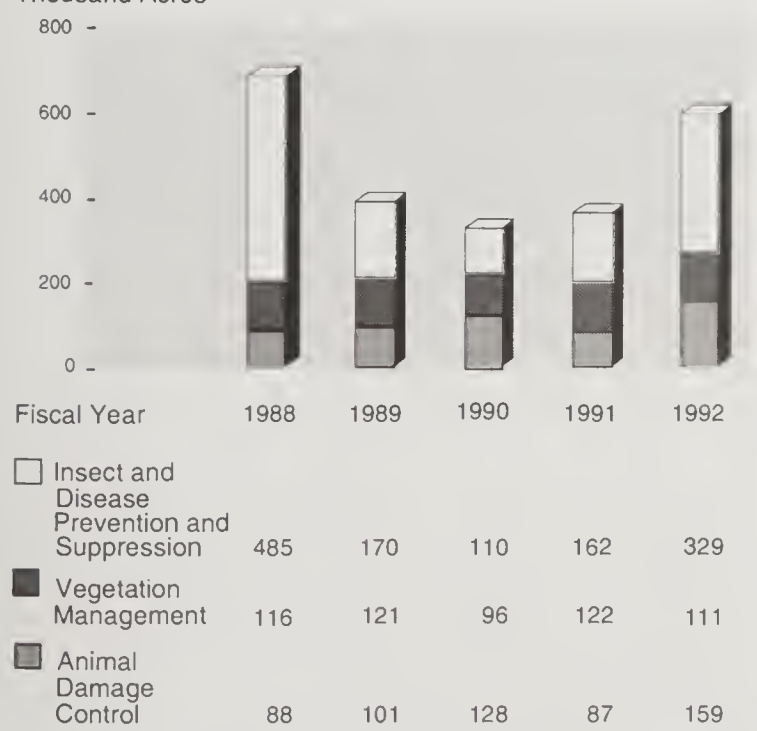
The Forest Service performed southern pine beetle, *Dendroctonus frontalis*, suppression activities such as salvaging infested trees, cut-and-leave harvesting, and piling and burning infested logging slash—on approximately 6,800 acres of the National Forest System in the Southeastern United States. Suppression activities protected about 22 million cubic feet and salvaged an additional 12 million cubic feet of pine timber.

Western spruce budworm, *Choristoneura occidentalis*, suppression projects using *Bt* were conducted on 171,200 acres of the Wallowa-Whitman and Umatilla National Forests in Oregon along with treatment of 15,300 acres of non-Federal land.

Figure 31.

Pesticide Use on the National Forest System

Thousand Acres



Suppression of mountain pine beetle, *Dendroctonus ponderosae*, was performed on 73,000 acres by harvesting, baiting and harvesting, or baiting and burning on 5 national forests. The forests are in Colorado, Idaho, Montana, South Dakota, and Wyoming. Approximately 34 million cubic feet of timber was protected, and an additional 6 million cubic feet of timber was salvaged.

Pesticide Use

The RPA Act (Sec. 3 (e)) requires that the use of pesticides on the National Forest System be reported annually.

In FY 1992, approximately 599,000 acres were treated with pesticides (figure 31). Treatments for insect and disease control included insecticides, fungicides, and fumigants. Vegetation management treatments were with herbicides. Animal damage control was accomplished with predacides, piscicides, rodenticides, and repellents (table 17).

FOREST MANAGEMENT

Forest management on the national forests includes inventory of forest resources, reforestation, care of forest vegetation, and harvest of trees in a manner that ensures environmental quality and meets a variety of forest plan objectives for wood products, wildlife habitat, water quality, and recreation settings.

Forest Vegetation Resource Inventory

In FY 1992, the Forest Service inventoried approximately 16.5 million acres. Forest vegetation resource inventories provide information needed to compile land classification, determine timber volume, and monitor growth rates. Information is also gathered for land and resource management plans and to provide a measure to evaluate changes during the planning period. In addition, this information is used for research publications and for the national assessment program required by the Forest and Rangeland Renewable Resources Planning Act (RPA).

Silvicultural Examinations

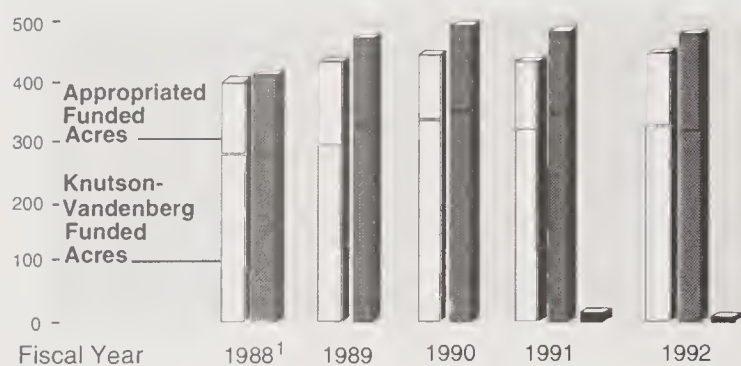
In FY 1992, the Forest Service completed silvicultural examinations on 4.8 million acres. These examinations provide data on existing ecological habitat, tree stand conditions (age, size, health, and vigor), and capabilities, growth, and mortality trends on a given site. Data from examinations are used to develop site-specific, integrated resource prescriptions to meet forest plan objectives.

Reforestation

Forest Service reforestation accomplishments continue at high levels. In FY 1992, the Forest Service reforested 492,000 acres (figure 32, table 18), with over 50 different species of trees. This level of reforestation is in recognition of the need to rehabilitate the large amount of acres that were devastated by the severe fires from 1987 to 1989 to meet the program objectives outlined in the 1990 RPA Program and complement the President's America the Beautiful efforts. Appropriated, Reforestation Trust, and carry-over funds reforested 162,600 acres; 10,000 acres were accomplished with contributed funds; and the Knutson-Vandenberg Act funds reforested 319,400 acres. Natural regeneration occurred on 166,300 acres and is included in the above numbers.

Figure 32.
Reforestation

Thousand Acres



□ Target					
Appropriated	119.0	142.1	109.9	114.0	123.4
K-V	283.0	296.3	338.6	322.8	326.5
■ Accomplished					
Appropriated	133.3	148.6 ²	145.0	138.2	162.6
K-V	282.8	327.3 ²	353.1	350.5	319.4
■ Contributed				14.5 ³	10.0 ³

¹ Does not include 36,800 acres of natural regeneration without site preparation.

² An additional 16,350 acres were reforested with contributed funds and were included in table 13.

³ Acres reforested with funds contributed from outside sources.

Over the past 5 years, an average of 90 percent of all reforestation has successfully met stocking objectives. Understocked plantations will be replanted to ensure adequate stocking levels. The currently understocked acres on the national forests needing reforestation total 1,069,000 acres, a decrease of 46,000 acres (tables 19 and 20) from 1991. Tables 21 and 22 display reforestation acres by States and regions, respectively, certified as being satisfactorily stocked. The 1990 RPA Program projects a 16-percent decrease (base year 1990) in reforestation by 1995, with reforestation projected to rise slightly between 1995 and 2040 but remain at less than 1990 levels.



Evaluating the effectiveness of an herbicide release treatment on a reforested burn, Stanislaus National Forest, California.

Photo by Mike Rutty



Checking the quality of seedlings at a Forest Service nursery.

FS Photo

Tree Nursery Operations

In FY 1992, ten Forest Service nurseries produced 116.3 million seedlings for reforestation—112.5 million bareroot and 3.8 million container seedlings. The seedling production costs are charged to the Working Capital Fund which, in turn, is repaid as a cost of seedlings by the reforestation program for the individual national forests. Contracts with State and private nurseries supplied the Forest Service with an additional 32 million seedlings.

To improve forest tree growth characteristics and disease resistance, the Forest Service maintains a tree improvement program. Seeds are collected from selected national forest trees that have natural superior growth or disease resistance and from tree seed orchards that produce genetically superior seedlings for outplanting on the national forests.

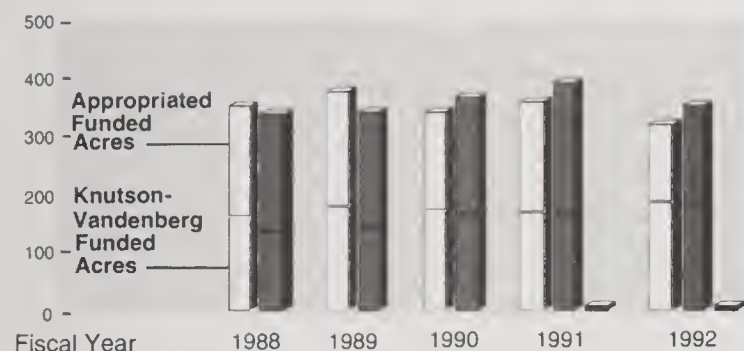
Timber yields may be increased by 10 percent on national forests reforested with genetically improved planting stock. The 14,272 pounds of seed harvested from seed orchards in FY 1992 represented 21 percent of the total seed collected by the Forest Service. During FY 1992, 16 percent of the acres planted on the national forests were planted with seedlings grown from seeds obtained from seed orchards.

Timber Stand Improvement

Timber stand improvement treatments were applied to a total of 354,800 acres (figure 33, table 23). Appropriated and carryover funds were used for treating 171,700 acres; contributed funds treated 1,700 acres; and Knutson-Vandenberg Act funds treated 181,400 acres. Timber stand improvement treatments are needed on an increasing number of acres to meet multiple-use management objectives and growth expectations in support of land and resource management plans. Timber stand improvement treatments were needed on a total of 1,307,000 acres as of the end of FY 1991, increasing to 1,385,000 acres at the end of FY 1992 (table 24). The 1990 RPA Program projects a 12-percent decrease (base year 1990) in timber stand improvement by 1995, with treatment acres projected to begin rising slightly after 1995, still below 1990 levels, and then gradually decrease toward 2040.

Figure 33.
Timber Stand Improvement

Thousand Acres



□ Target	Appropriated	187.0	197.6	166.8	191.4	133.2
	K-V	166.0	179.5	175.1	169.8	187.0
■ Accomplished	Appropriated	199.0	196.9 ¹	200.3	226.4	171.7
	K-V	138.2	146.1 ¹	166.6	167.3	181.4
■ Contributed				2.1 ²	1.7 ²	

¹ An additional 3,278 acres were accomplished with contributed funds and were included in table 18.

² Acres accomplished with funds contributed from outside sources.

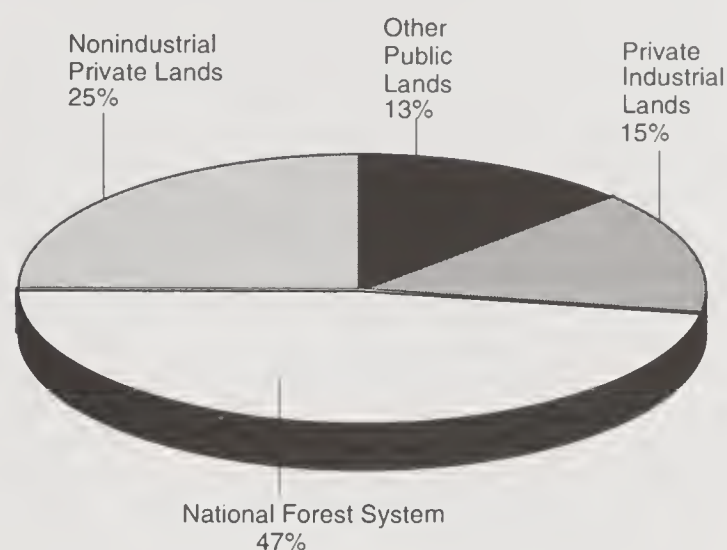
Timber Sale Preparation, Offering, and Harvest

The National Forest System contains 47 percent of the Nation's standing softwood sawtimber inventory (figure 34). However, of the Nation's softwood sawtimber volume used for lumber in FY 1992, the National Forest System contributes approximately 14 percent. Overall, the National Forest System



Timber stand improvements help provide forests for current and future needs. FS Photo

Figure 34.
Inventory of Standing Softwood Sawtimber
by Ownership—FY 1992¹

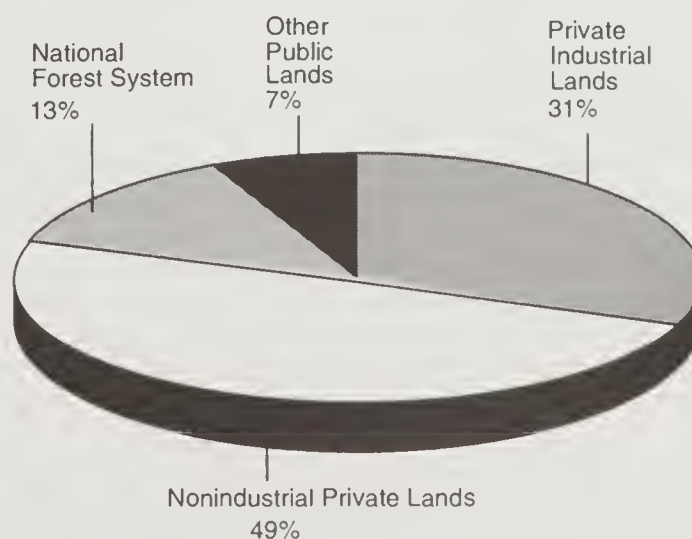


¹ Data taken from "Forest Statistics of the United States, 1987." PNW-R8-168

provided 13 percent of the total wood volume harvested in the United States in FY 1987 (the last year for which data was available). This compares with 49 percent from nonindustrial private forest lands, 31 percent from lands owned by industry, and 6 percent from other public lands (figure 35).

In FY 1992, the Forest Service sold 4.5 billion board feet (0.9 billion cubic feet), including volume offered in FY 1991 that was sold in FY 1992. This is 52 percent of the funded target of 8.6 billion board feet (1.7 billion cubic feet) of timber offered for sale. The Forest Service offered 5.1 billion board feet (1.3 billion cubic feet) for sale in FY 1992. The decreased accomplishment level for volume offered was due to Forest Service management actions in response to environmental concerns relating to old-growth forests, the northern spotted owl, the red-cockaded

Figure 35.
Percentage of Total Annual Wood Harvested from
Lands in the United States—FY 1992¹

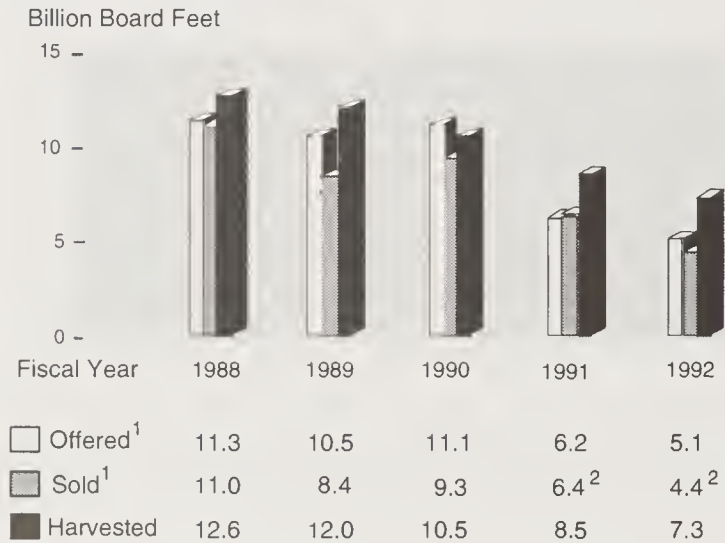


¹ Data taken from "Forest Statistics of the United States, 1987." PNW-R8-168

46 woodpecker, and actions related to administrative appeals and litigation. At the end of FY 1992, servicewide, 1,626 timber sales were under administrative review, 107 of which were stayed until the review is resolved.

Sale volume includes green timber, salvage timber, and firewood. Figure 36 displays the total timber offered, sold, and harvested; and figure 37 displays the timber offered, sold, harvested and under contract by Forest Service Region. Table 26 displays the timber offered, sold, and harvested for fiscal years 1988-92. Table 27 provides information, by Region, on timber offered, sold, and harvested. Table 28 displays the timber offered and sold by each State for FY 1991. Table 29 displays number of sales, volume, and value of timber sold by size class for FY 1992. Table 30 displays, by Region, uncut timber volume under contract. The 1990 RPA Program projects a 3-percent decrease (base year 1990) in timber offered by 1995, with offer levels projected to rise 8 percent between 1995 and 2040. Funding levels for the Forest Service timber program are displayed in table 31.

Figure 36.
Timber Offered, Sold, and Harvested



The Forest Service's timber sale revenues continue to exceed program costs. In FY 1992, timber sale expenses, including roads and accounting for extraordinary losses, were \$821.9 million; timber harvest revenues were \$1.077 billion (table 32).

The Forest Service has shifted from its reliance on the use of clearcuts as a regeneration technique to other even-aged regeneration methods and to uneven-aged regeneration methods. Clearcuts decreased 13 percent from FY 1991 to FY 1992, due primarily to the reduction in volume offered.

Salvage Sale Program

In FY 1992, the Forest Service sold 1.46 billion board feet (284 million cubic feet) of salvageable timber. This volume is part of the total FY 1992 sale volume. Small timber operators (those



Fire salvage harvesting on a national forest in California. FS Photo

with fewer than 25 employees) purchased approximately 4 percent of the timber sold under the salvage sale program. Salvage sales revenues cover the costs of preparing and administering sales of insect-infested, dead, damaged, or downed timber, including the engineering costs for roads.

In recent years, salvage sale offerings stemmed from the large catastrophic forest fires in the West, insect attacks in the northern Rocky Mountains and portions of the South, and tree mortality from prolonged drought conditions in the Sierra Nevada Mountains.

Timber Sale Program Information Reporting System (TSPIRS)

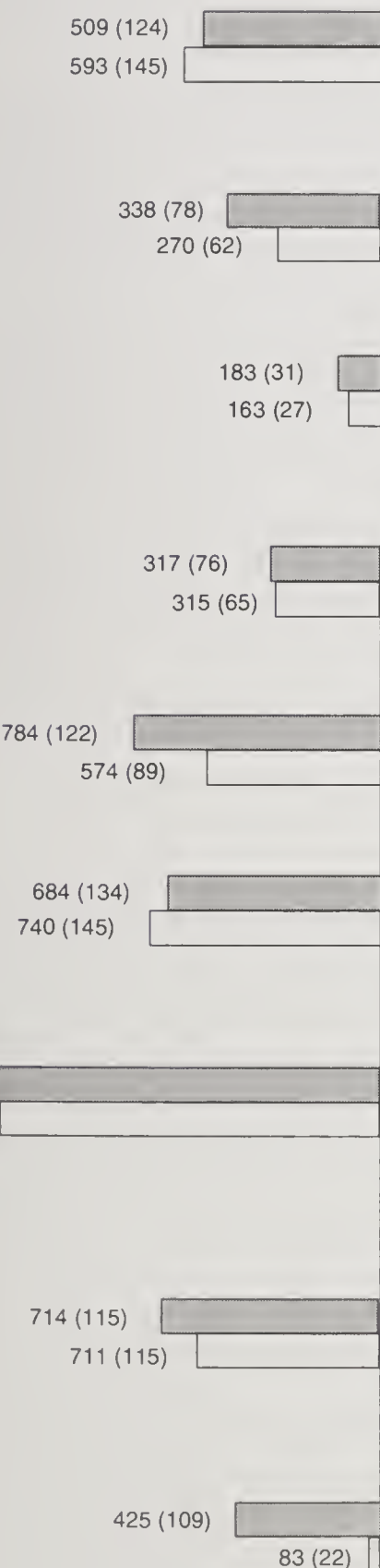
The National Forest Management Act (1976), Section 6(1), requires the Forest Service to estimate the long-term costs and benefits of the agency's timber program. Prior to the development of TSPIRS, this requirement was met through the analysis of a sample of timber sales. TSPIRS more completely meets the Section 6(1) requirement by providing the total estimated long-term benefits and costs of all national forest timber sale programs. The reporting system's official results for FY 1992 display a statement of timber sale revenues and expenses (table 32), employment, income, and program level account (table 33), and the economic account (table 34).

Figure 37.

Timber Offered and Sold - FY 1992

Million Board Feet (Million Cubic Feet)

Offered
Sold

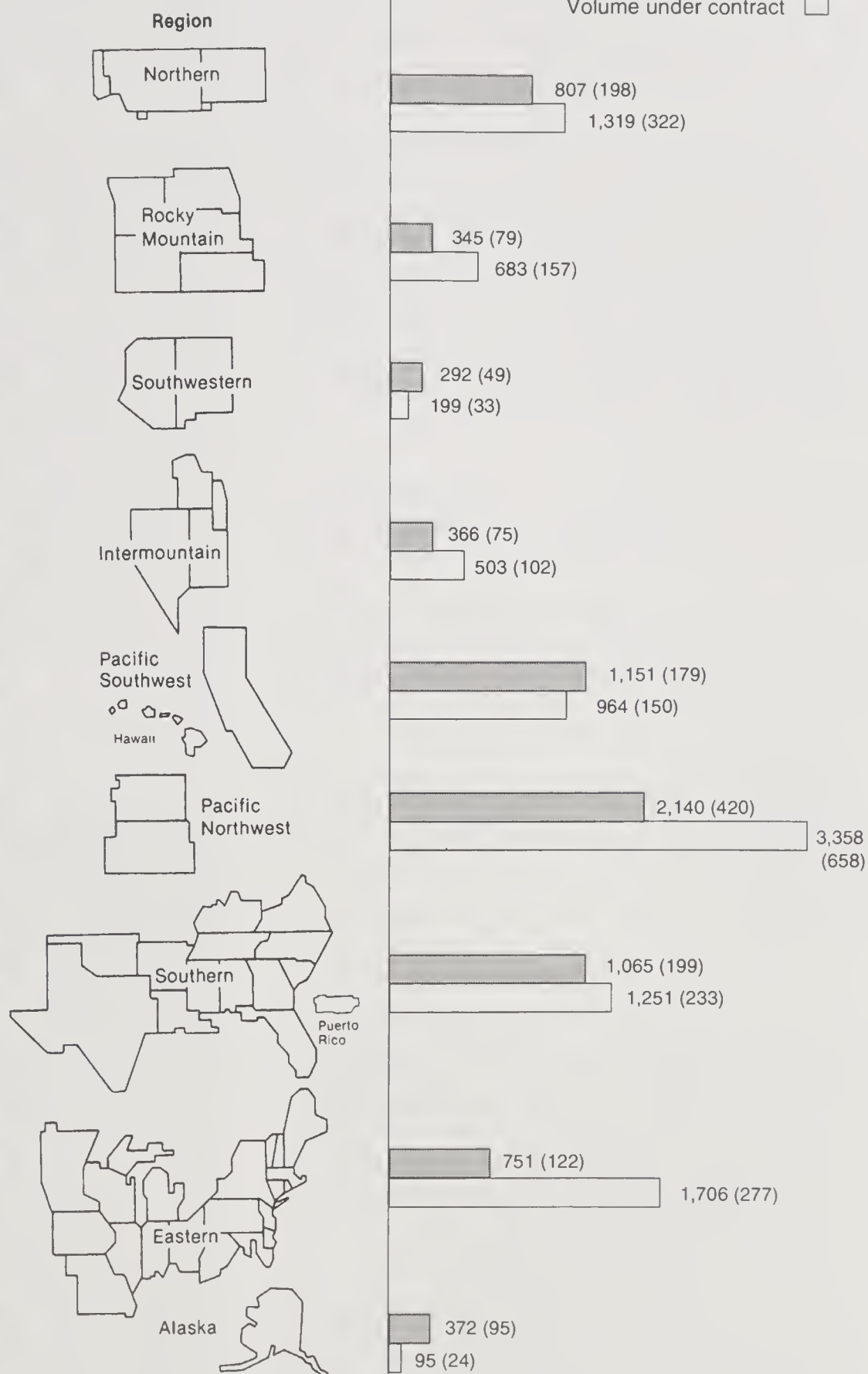


Timber Harvested - FY 1992

Timber Volume Under Contract - FY 1992

Million Board Feet (Million Cubic Feet)

Harvested
Volume under contract



Total Uncut Timber Under Contract—10,078 Million Board Feet (1,956 Million Cubic Feet)

Timber Exports

The Forest Resources Conservation and Shortage Relief Act of 1990 was signed by the President on August 20, 1990. The Act makes permanent the current restrictions on export of Federal logs and, except for some limited exceptions, bans both direct and indirect substitution of Federal logs for exported private logs from lands west of the 100th meridian in the contiguous 48 States. The Act provides for establishment of surplus species and sourcing area boundaries, and it sets significant penalties and administrative remedies for violations.

The Forest Service published a notice of statutory restrictions in the "Federal Register" (FR) on September 17, 1990 (55 FR 36123), followed by publication of an interim rule on November 20, 1990 (55 FR 48572). Two proposed rules were published in the "Federal Register" on January 29, 1991 (56 FR 3354 and 56 FR 3375). A final rule of limited scope was published December 19, 1991 (56 FR 65384), which, in part, established the procedures for applying for a share of the 50-million-board-foot exemption to the indirect substitution restriction for national forest timber originating from within the State of Washington. Seven applications were received and two were approved, establishing 16 million board feet of exemption.

The final comprehensive rule fully implementing the Act is expected to be published in FY 1993, to be followed immediately by publication of a proposed rule establishing species determined to be surplus to domestic manufacturing needs.

The 42 sourcing areas approved by the Department's Chief Administrative Law Judge in FY 1991 are functioning as anticipated by the Act. Export activities continue to be closely monitored by Forest Officers and several possible substitution violation cases are currently under investigation.

Excess Timber Receipts

The 1989 Department of the Interior and Related Agencies Appropriations Act (Public Law 100-446) required that all timber receipts in excess of \$791 million be made available (until expended) to the Secretary of Agriculture for additional improvements in specific resources on the national forests. Under this provision, \$97.5 million was available in FY 1989. At the end of FY 1990, the fund balance remaining to be expended was \$10.8 million. The balance of the work was accomplished in FY 1991.

Cubic Measurement

Working with specialists in the timber industry, the Forest Service continued development of a cubic measurement system to replace the board-foot system for measuring timber. This cooperative effort led to the development of a Cubic Foot Log Scaling Rule, which the Forest Service will use as it converts timber sale processes from board-foot units to cubic units over the next several years.

Cubic measurement is a consistent and constant unit of measure—one that is simpler and fairer than the board-foot unit because it is free from "rules of thumb" and adjustment factors and is easier to understand. It also reduces sampling and measuring costs of standing and harvested timber, and it can be applied to all wood products, not just lumber.

Firewood and Other Forest Products

The National Forest System provided 921,000 cords of firewood for personal use—at a value of \$5.1 million. This volume is part of the total FY 1992 sale volume. For many individuals and families, gathering firewood provides not only an energy alternative but also an enjoyable outdoor recreation experience. Firewood is measured, appraised, and sold in standard 128-cubic-foot cords, containing about 80 cubic feet of wood. The firewood sales program works on a charge system; fees cover administrative and management costs.

The National Forest System offers users a wide variety of other forest products. Round wood products such as house logs, poles, posts, and fence rails are provided to many users for commercial or personal purposes on an individual piece basis or per linear foot. Bolts of cedar and other rot-resistant species that can be split into roofing shingles are sold by the cord.

There is a popular demand for Christmas trees—both cut and dug for later planting and for the traditional recreation experience. Christmas trees and "wildings" used in landscaping are sold on an individual tree basis. Cedar boughs are sold by the ton, as are various ferns and evergreen brush species used by the floral industry. Some National Forest System products such as pinyon nuts, jojoba beans, bear grass, and mushrooms are sold by the pound. The bark of several tree species such as the cascara tree and Pacific yew, which is used for medicinal purposes (see below), is sold by weight. Sap tapped from the trunks of various tree species is sold by the gallon for such diverse products as naval stores, maple syrup, and spruce gum. Dried cones used for decorative purposes are sold by the sack or by the bushel.

Pacific Yew—A Source of the Anticancer Drug Taxol

Taxol, a chemical extracted from Pacific yew (*Taxus brevifolia*), is an extremely effective anticancer drug. Patients with ovarian cancer have shown a 30-percent response rate (tumor shrinkage) to taxol treatment even when they had previously shown no response to other treatments. Recent data suggest the response rate for treating breast cancer will also be significant. Clinical trials for ovarian, breast, and other types of cancer have increased dramatically since March 1991, due to the improved supply of the drug. The Food and Drug Administration approved the use of taxol for treatment of refractory ovarian cancer on December 29, 1992. Taxol is expected to be a major drug for treating cancer patients, and this will require a steady supply of the raw material, Pacific yew bark, through at least 1995. Progress is being made on producing taxol from precursors extracted from needles of *Taxus baccata* and this product should be on the market in 1994.

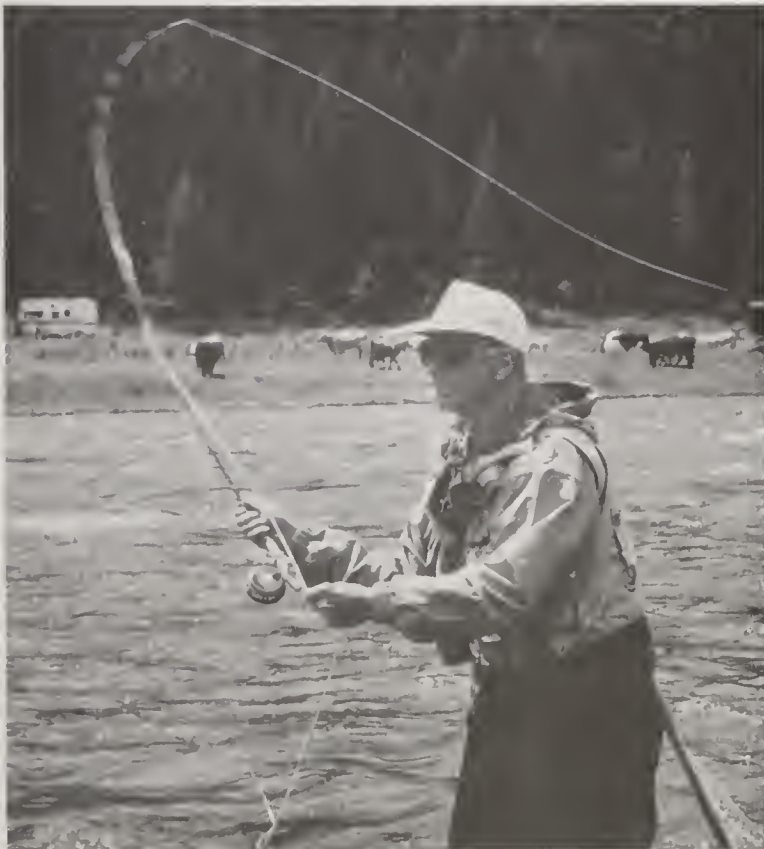
"An Interim Guide to the Conservation and Management of Pacific Yew" was published in April 1992, and these guidelines were implemented for the 1992 bark harvest season. The Pacific yew inventory in Regions 1 and 6 (Oregon, Washington, Idaho, and Montana) was completed, and data gathered was included in the Programmatic Environmental Impact Statement published in January 1993. Approximately 700,000 pounds of dry Pacific yew bark was collected from the National Forest System in FY 1992.

On August 7, 1992, President Bush signed the Pacific Yew Act. The purposes of this law are to provide for the efficient collection and utilization of Pacific yew to ensure the long-term conservation of the species, and to prevent the wasting of the resource. The law also gives the Forest Service the authority to negotiate the sale of Pacific yew to parties approved by the Food and Drug Administration to manufacture taxol for human use and to use the receipts to fund the program.

RANGELAND MANAGEMENT

The "Change on the Range" initiative, in place for 6 years now, gave the Forest Service rangeland management program a significant "head start" in implementing ecosystem management concepts. More than ever, in FY 1992 rangeland management reflected an ecological approach emphasizing restoration and long-term health of rangelands, and more meaningful participation by people who share them. Riparian area restoration, watershed protection, maintenance of soil productivity, and improvement of rangeland condition rank high in management priority. Closer partnerships with rangeland users are giving rise to creative new approaches aimed at promoting both ecological health and quality of life for rural families and communities.

As part of the continuing "Change on the Range" philosophy, rangeland management implemented its "New Measures" program for analyzing accomplishments in FY 1992. The new system, like the old, gives an accounting of activities that have occurred on national forest rangelands. More importantly, however, it provides the means to evaluate how all those activities add up in achieving progress toward better condition of rangeland ecosystems. Improved methods for accountability, as exemplified by the "New Measures," result in better stewardship of the National Forest System.



Protecting and improving fish habitat is part of managing rangeland ecosystems. FS Photo

The Forest Service manages over 97 million acres in 33 States open to grazing by permitted livestock. In addition to its use for livestock grazing, healthy rangeland provides quality wildlife habitat, stable soils, and clean and abundant water. The range program was funded at \$48.0 million (including the Range Betterment Fund) in FY 1992 and returned \$10.8 million to the Treasury from grazing fees (figure 38).

Figure 38.

Range—Funding and Receipts

Million 1992 Dollars



Range Management Funding	33.9	34.0	35.2	40.6	43.2
Range Betterment Funding	4.2	4.3	5.2	4.6	4.8
Grazing Receipts	10.1	12.1	10.9	11.8	10.8
Receipts as Percentage of Funding	26	32	27	26	23

Noxious weeds infest about 5 million acres of the National Forest System in the Western States. Weeds negatively affect many resource conditions and characteristics. The control of noxious weeds requires coordinated efforts by all landowners in an infested area. In FY 1992, local weed control districts and the Forest Service worked together to treat 36,475 acres of National Forest System lands. This exceeded targeted accomplishment by 7,811 acres.



Noxious weeds continue to be a problem for the Western States
FS Photo

Over 3,000 wild horses and burros graze on National Forest System lands. In FY 1992, no wild horse and burro removals were reported.

Livestock Grazing

In FY 1992, the Forest Service administered 9,940 paid permits for 9.4 million animal unit months (AUM's) of grazing by domestic cattle, horses, sheep, and goats. Total permitted AUM's continue to decline slightly as forest plans which focus on a balance of resource values and outputs are implemented. Rangeland management efforts are changing as the agency moves to manage rangelands as complete ecosystems.

An effort was initiated in the Western States to develop demonstration projects that illustrate practical solutions to the interconnected issues of big-game and livestock management. Project proposals were solicited from a variety of governmental, wildlife, and livestock producer organizations under the umbrella title "Seeking Common Ground." A panel consisting of representatives from the Forest Service, Bureau of Land Management, Wildlife Management Institute, International Association of Fish and Wildlife Agencies, Rocky Mountain Elk Foundation, Public Lands Council, and American Farm Bureau Federation was established to evaluate proposals from 11 States. Finalists will be funded in early 1993 from a mix of government and private sources. On-the-ground accomplishments will be monitored and reported when fully implemented.



Rangeland ecosystems provide abundant forage for livestock and big game. FS Photo

Range and Riparian Conditions

Approximately 75 million acres of the National Forest System have range vegetation management objectives. Of those, approximately 61 percent (46.2 million acres) were reported as being under satisfactory management in FY 1992. Satisfactory management is defined as managing rangelands to achieve forest plan objectives.

Management is often the key to improving or maintaining rangeland in satisfactory condition. Some 4,157 structural improvements such as fences and water developments were constructed with appropriated funds to ensure proper management of livestock on forest lands. This exceeded targeted accomplishment by 2,376 structures. Other improvement work, such as prescribed burning, seeding, and mechanical

treatments, was accomplished on 108,311 acres to improve biological diversity and achieve the desired future condition. This exceeded targeted accomplishment by 30,311 acres.

Knutson-Vandenberg Act funds covered the costs of approximately 11 percent of all structural and 28 percent of all nonstructural improvements. KV funds are timber sale revenues spent on range improvements done within timber sale boundaries. In addition, the Forest Service accomplished 224 high-priority structural improvements and 423 acres of forage improvement with labor, funds, and materials donated by cooperating permittees, other agencies, and volunteers.

In FY 1992, the rangeland management staff continued recruitment and retention efforts in order to improve the ethnic, gender, and cultural diversity of rangeland managers.

SOIL, WATER, AIR, AND WEATHER MANAGEMENT

Riparian and Wetlands Management

The restoration of riparian areas and wetlands continued throughout the National Forest System in FY 1992. Following the Chief's Riparian Strategy announced in FY 1991, important ecosystem values and functions are being restored where they had been degraded in the past. One example is found in Alaska, where the fisheries and hydrology program staffs of the Chatham Area Supervisor's Office and Sitka Ranger District have joined forces with Sitka High School on an "Adopt a Stream" program.

On the Idaho Panhandle National Forests, a variety of riparian restoration work was completed in FY 1992. Western Redcedar was, at one time, a major component of riparian ecosystems along major creeks and rivers. In the early part of this century, it was depleted through logging and the extensive fires that burned through the area. High water tables, frost, vegetative competition, and the attraction of wildlife and domestic stock to cedar have combined to thwart regeneration. Controlled studies are underway on the Saint Maries Ranger District to find effective techniques to re-establish this important component of northern Idaho's riparian ecosystem.



Wetland restoration continues to be an important goal of national forest management. FS Photo

On the adjacent Wallace Ranger District, a comprehensive plan to restore the Upper Coeur d'Alene watershed was implemented this year. Interdisciplinary teams gathered data, developed the restoration prescription, and then carried out the work. Roads were obliterated, contours restored, and flood plains reconstructed. Log structures were placed in the stream channel where data showed they were deficient. And finally, riparian vegetation was re-established. As a result, channel stability was restored, soil erosion and flood potential were reduced, and over time, critical fish habitat and a valuable riparian ecosystem will recover.

Soil and Water Quality Monitoring

The Forest Service nonpoint source pollution program is monitoring the effectiveness of soil and water conservation measures on watersheds to ensure that environmental standards for water quality and soil erosion are met.

For example, in the Pacific Southwest Region in FY 1992 the "Best Management Practices Evaluation Program" (BMPEP) was initiated to monitor both the implementation and the effectiveness of water quality control measures applied on national forests in California. The program is designed to fulfill monitoring commitments for land and resource management planning as well as attainment of water quality goals. During FY 1992, over 40 workshops 1-3 days long were held on a number of forests and ranger districts in Region 5. Over 900 students received over 4,000 contact hours of instruction, mostly in field settings. Topics included various aspects of soil quality and sampling to evaluate if significant changes are occurring.

In Alaska, the Stikine area of the Tongass National Forest conducted water quality monitoring to evaluate the effects of woodfill road construction. Results will be compared to State water quality standards, and will be used to recommend BMP's for future woodfill projects.

The Mt. Hood National Forest in Oregon continues to maintain an intensive water quality monitoring program in cooperation with the City of Portland. Monitoring in the Bull Run watershed is used to meet legal requirements for maintenance of water quality of the streams which supply drinking water to the Portland metropolitan area. Enhancements to the monitoring program in the last year include automated, flow stratified sampling of select physical and chemical variables. This monitoring program provides forest managers and the city with valuable information about water quality response to climatic conditions and management.

Soil Resource Inventories

In FY 1992, soils were inventoried on over 6.3 million acres; the inventory is now about 65 percent complete. The 1990 RPA Program goal of inventorying all of the National Forest System by the year 2000 will not be met at this current rate of progress.

There is a growing trend to take more of an ecological approach to soil inventories, adding more emphasis on vegetation, geology and the hydrological components to make for more reliable ecological interpretations. For example, ecological inventory crews consisting of soil scientist, plant ecologist and geologists were used on the Bridger-Teton and Targhee National Forests in FY 1992 to inventory and classify ecological types and design ecological unit maps.

In FY 1992, a draft "National Hierarchical Framework of Ecological Units" was developed to better address ecosystem management. In conjunction with the framework, a "National Ecological Database" is being developed to manage information derived from the ecological inventories.

Long-Term Soil Productivity Study

The Forest Service is establishing soil quality threshold standards for soil compaction and organic matter content. The standards will serve as benchmarks to guide forest practices, monitor trends in soil conditions, and assess the effectiveness of soil and water conservation practices. A national network of study plots is being established to help validate and set the standards. This major effort involves five regions and six research stations. In FY 1992, study plots were installed in Louisiana, Michigan, North Carolina, and California. Universities, other agencies, Canada, and New Zealand are showing interest in cooperating in this study.

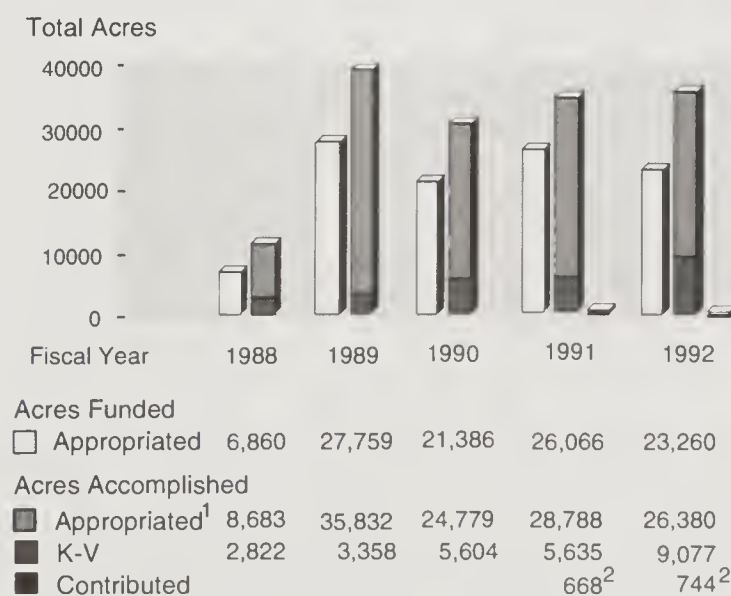
Watershed Improvement Program

Improvement projects were completed on 36,201 acres of the National Forest System in FY 1992 (figure 39). Revegetation, soil stabilization, and channel rebuilding techniques contribute to the restoration of watershed function, helping to ensure improved water quality and quantity for the future.

The Targhee National Forest in Idaho entered into an innovative partnership with the Henry's Fork Foundation to initiate the restoration of quality fisheries in the Henry's Fork watershed, threatened by sediment increases as a result of the North Fork fire in 1988. The foundation contributed over \$5,000 toward the rehabilitation work in FY 1992. The project treated approximately 950 acres with a combination of aerial seeding, contour felling, soil scarification, and the installation of in-channel structures. This model project will continue in the next few years as additional funding becomes available.

Figure 39.

Watershed Improvements—Acres





Installing checkdams can reduce sedimentation and protect watershed quality. FS Photo

In Virginia, Youth Conservation Corps enrollees maintained watershed improvements on an abandoned mine site on the George Washington National Forest. This project was initiated through a cooperative effort between the State of Virginia Department of Mines and Energy and the Forest Service.

Burned Area Emergency Rehabilitation

Over 36,500 acres were treated with emergency measures to prevent the loss of life, property, and other important downstream values as a result of wildfire.

Emergency treatment was begun on the Foothills Fire, which burned over 257,000 acres near Boise, Idaho, including approximately 130,000 acres of the Boise National Forest. Rehabilitation measures included over 90,000 acres of aerial grass seeding to re-establish soil holding vegetation in the shortest period of time, 26,000 acres of contour felling to slow the downslope movement of soil, and the construction of 3,100 straw bale or log channel structures to trap sediment and prevent down-cutting of stream channels. In addition, partnerships were developed with the Rocky Mountain Elk Foundation



Workers use burned timber to prevent downslope soil movement during rehabilitation efforts for the Foothills Fire, Boise National Forest, Idaho. Photo by Riva Frye

to restore critical big-game winter range; with the Idaho National Guard to transport and store erosion control seed; with the Bureau of Reclamation to provide remote automated weather stations; and with the Southern Idaho Corrections Institute to help complete the massive rehabilitation effort.

Weather Program

The Forest Service monitored weather data from over 300 Remote Automatic Weather stations in FY 1992. These data, along with National Weather Service products, will be available through the Weather Information Management System (WIMS). WIMS is a comprehensive system to manage forestry weather information nationwide and will aid in integrated resource management decisionmaking and help meet increasing climate data requirements. The WIMS software contract was completed in March 1992, and will become fully operational in January 1993, when it replaces the current Administrative Forest Fire Information and Management System.

The weather program continues to play a major role in the interagency coordination of weather data collection and dissemination to help ensure that resource managers have quality data for the increasing number of applications.

Air Resource Management

In FY 1992, the air management program supported over 55 visibility monitoring sites and 9 IMPROVE (Interagency Monitoring of PROtected Visual Environments) network sites in cooperation with the Environmental Protection Agency. In addition, it continued lake and stream chemistry and biological studies in key sensitive areas.

The 1990 RPA Program projects increases in the number of monitoring sites between 1990 and 1995. Since the number of monitoring sites has increased in previous years, the air program focus in FY 1992 was on the evaluation of data collected and the monitoring techniques used at the existing sites. This evaluation is resulting in better standardization, changes in some equipment to provide better capacity for the analysis of trends, and setting priorities for the areas needing monitoring. This has resulted in discontinuing some sites, starting up others, and changing the equipment on many.

In FY 1992, 49 Prevention of Significant Deterioration (PSD) of air quality applications were reviewed by Forest Service specialists. The agency screening process for assessing the impacts on Class I air-quality-related values indicated an adverse finding in one location in the Eastern United States, and a preliminary adverse finding in the Western United States. In these cases and with other previous determinations, the Forest Service has continued to work with the Environmental Protection Agency, the States, and the involved applicants to mitigate the predicted impacts.

The Forest Service has been active in the Grand Canyon Visibility Transport Commission, set up to protect the visibility of the Class I areas in the vicinity of the Grand Canyon (the Forest Service manages 8 in the area). The agency has also worked with the Environmental Protection Agency and South-eastern States to establish a working group to address regional air quality concerns.

Water Rights Adjudication

In FY 1992, the Forest Service was involved in water rights adjudications in Idaho, Montana, Arizona, Nevada, Oregon, Utah, and several other Western states. The Forest Service continued to prepare claims for consumptive water uses and instream flows in five regions.

A stream systems technology center was established in Fort Collins, Colorado, in FY 1992. The center's mission is to improve knowledge of mountain stream systems and processes, identify research needs, develop operational tools, and provide training and technical support to land managers as they seek to secure conditions of water flows mandated by the 1897 Organic Administration Act.

MINERALS AND GEOLOGY MANAGEMENT

Exploration, development, and production of energy and mineral resources from the National Forest System contribute to the growth and security of the Nation, provide locally significant employment (usually in rural communities), and raise revenues for the United States Treasury. The program is directed at maximizing these benefits while ensuring that development is conducted in an environmentally acceptable manner. Particular efforts are made to ensure that appropriate protection is given to other resource values and the environment, and that the land is restored to a productive condition. The five major components of the Minerals and Geology Management program, along with selected FY 1992 accomplishments, are described below.

- Leasable minerals include oil and gas, coal, geothermal energy, phosphate, hardrock minerals (in acquired lands), and certain other commodities. During FY 1992, approximately 9 million acres were under lease, mostly for oil and gas. The Forest Service reviews leasing proposals, authorizes the Bureau of Land Management to issue leases, and then administers postlease surface use operations and reclamation.
- In FY 1992, bonus bids in excess of \$160 million were generated for the United States Treasury from the mineral rights supporting several coal mines located on the Thunder Basin Grasslands in Wyoming. When mining begins, the Treasury will receive an additional 12.5 percent of the coal value.
- Locatable minerals include gold, silver, copper, zinc, and other minerals made available under the Mining Law of 1872. The Forest Service regulates these mineral operations to mitigate environmental effects and to ensure proper reclamation. Out of an estimated 7,000 active mine sites on the National Forest System, about 1,200 are producing mines.
- Mineral materials include sand, gravel, stone, pumice, cinders, and other minerals considered to be fairly common in occurrence. These commodities are of considerable importance in supplying local construction, road building, and landscaping needs. The Forest Service



The Holden Mine on the Wenatchee National Forest was the first major hazardous waste site cleanup administered on the National Forest System. FS Photo

manages over 1,000 pits and quarries and conducts sales (government entities are allowed free use), monitors operations, and specifies reclamation measures. During FY 1992, efforts to assist the economies of rural communities were made by emphasizing opportunities for production and use of building stone.

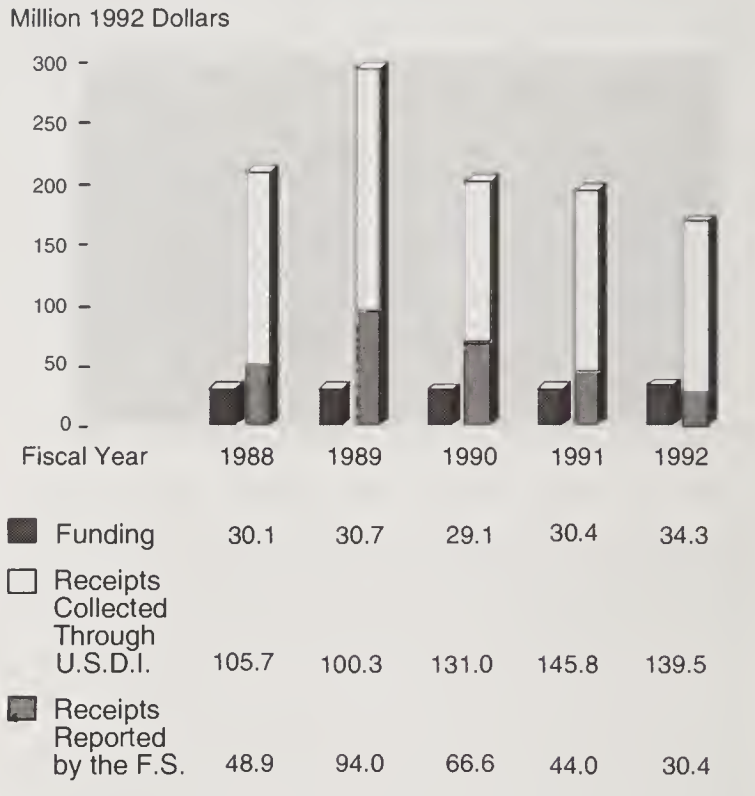
- Reserved and outstanding rights involve privately owned minerals which underlie approximately 20 million acres of the National Forest System. Most of the lands with underlying private minerals were acquired under the Weeks Law, enacted in 1911 for watershed protection purposes. The Forest Service cooperates with the developers of these minerals to mitigate effects on forest users and the environment.
- Geology management provides for the inventory, assessment, investigation, and interpretation of earth science information for a wide range of Forest Service programs and activities. This includes supporting an ecological framework for land and resource management planning and monitoring; providing recommendations for increased public safety and cost-effective approaches to mined land reclamation, timber sale layout, and road and other facilities construction; assessing mineral and energy resources; and evaluating, managing, and protecting ground water, cave, and fossil resources on the National Forest System.

Funding and receipts for the minerals and geology management program are shown in figure 40. Accomplishments and mineral workload and production are displayed in tables 39 and 40.



Monitoring the health of fish populations near mining activities is part of the on-going administration of active mines. FS Photo

Figure 40.
Minerals—Funding and Receipts



ENGINEERING

Infrastructure

Infrastructure refers to the facilities, utilities, and transportation systems needed to meet public and administrative needs. Water and sanitation systems, recreation facilities, administrative buildings, roads, and other constructed facilities comprise the infrastructure within the Forest Service.

Transportation System

Virtually all activities on the National Forest System depend, to some extent, on the Forest Development Road System. System roads are managed in accordance with decisions reached during the land management planning process. These roads are constructed, operated, and maintained to the minimum standard necessary to provide safe, economical, and environmentally acceptable access.

Recreationists make up the majority of users of Forest Development Roads. Total recreation use in FY 1992 for activities such as hiking, hunting, skiing, camping, and driving for pleasure was 288 million visitor days, most of which was dependent on the Forest Development Road System to access a recreation destination.

Existing Road System

The Forest Development Road System currently consists of 369,000 miles of arterial, collector, and local roads. During FY 1992, 25 percent of the road system was intended for use by passenger cars; 57 percent was intended for use by high-clearance vehicles (such as pickup trucks and four-wheel-drive vehicles); and 18 percent was closed to motorized traffic all year long.



Local roads make up the bulk (74 percent) of the national forest transportation system and provide limited access to national forest lands. Access to hunting areas is one of many popular uses of local roads. FS Photo



Arterial roads like this one make up 7 percent of the national forest transportation system. Collector roads, generally single lane, comprise the remaining 19 percent of the system roads. FS Photo

The Forest Service often imposes seasonal restrictions on road use when necessary to protect wildlife during migration, mating, or rearing periods; to prevent fires; to prevent road damage when the road is unstable; and to provide for public safety during periods of high fire danger.

During FY 1992, the Forest Service expended \$91 million in Federal appropriations to accomplish road and bridge maintenance in support of administrative use and noncommercial forest users. Commercial users expended an additional estimated \$74 million for road maintenance work related to their commercial activities. Of the total \$74 million, timber purchasers accounted for \$66 million, while other commercial users accounted for \$8 million.

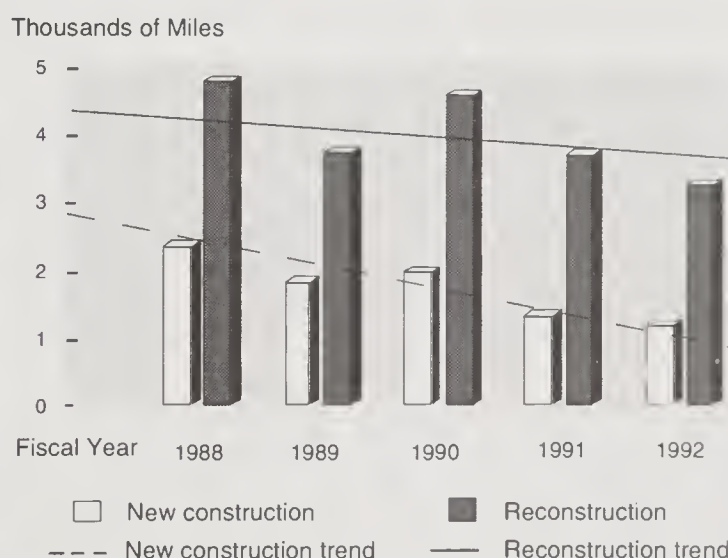
The continuing decline in the amount of timber being hauled over Forest Development Roads has resulted in a decrease in the amount of road maintenance performed by timber purchasers. The decline in this type of road maintenance will increase the backlog of traffic-related maintenance and potentially affect the safety of other forest road users.

To help control costs and improve program flexibility, forests continued to contract for road maintenance. The forests also continue to work with State, county, and local agencies to reduce costs for all parties. Road maintenance costs by State are shown in table 43.

The 1990 RPA Program projects an increase in road reconstruction. As can be seen in figure 41, the downward trend in the number of miles of reconstructed roads continues. This decrease is due to the decline in the amount of timber being harvested.

Figure 41.

Road Accomplishment Trends—Construction and Reconstruction



Reconstruction was required on 3,259 miles of existing Forest Development Roads in FY 1992. The primary purpose for the reconstruction of these roads was to accommodate increased levels of traffic, improve public safety, and improve environmental protection. Surfacing and drainage improvements, road realignment to improve sight distance, addition of turnouts, and erosion protection were the types of reconstruction work performed.

Road reconstruction by State for appropriated funds, purchaser credits, and purchaser election funds are shown in tables 41 and 42. A summary of planned vs. accomplished miles of reconstructed roads can be seen in figure 42. The decrease in mileage is consistent with the decrease in timber sale volume.

In FY 1992, 4,000 miles of road which were no longer needed to implement forest plans were obliterated and the land restored for production of vegetation. Obliterating roads with road maintenance funds was possible due to special language in the FY 1992 appropriation. This work was often a vital element of the restoration of riparian areas, improvement of water quality, and improvement of wildlife habitat.

Figure 42.

FOREST SERVICE ROADS PROGRAM
SUMMARY OF PLANNED VS. ACTUAL ACCOMPLISHMENTS FOR FY 1992

Funding Source 1/	Construction Miles (New Roads)		Reconstruction Miles (Improved Existing Roads)	
	Planned	Accomplished	Planned	Accomplished
PCP	1,508	1,023	3,015	2,339
PEP	85	57	130	167
FRP & TTTSF	114	100 2/	688	753
Total	1,707	1,180	3,833	3,259

1/ Funds for forest road construction and reconstruction come from several sources. The Purchaser Credit Program (PCP) allows timber purchasers a credit against the price of the timber they buy equal to the cost of the roads they construct or reconstruct to harvest timber. The Purchaser Election Program (PEP) allows purchasers qualified as small businesses to have the Forest Service build the roads using funds from timber receipts. The Forest Road Program (FRP) finances the construction and reconstruction of recreation, general purpose, and some timber access roads from appropriated funds. FRP finances engineering, right-of-way, and administrative support for all road construction and reconstruction done under PCP, PEP, and FRP. FRP also finances the environmental studies and interdisciplinary professional analysis associated with road construction activities.

2/ Includes 2.5 miles under construction with Tongass Timber Supply funds (TTTSF).

Newly Constructed Roads

The 1990 RPA Program projects a decrease in new road construction. As shown in figure 41, FY 1992 continued the downward trend in new road construction miles. During the same time period, the proportion of Forest Road Program funds spent on recreation and general-purpose roads (roads which serve all forest users) increased from 16 percent to 51 percent. These trends are consistent with a road system that is largely in place, with an increasing emphasis on recreation and general-purpose use.

During FY 1992, the Forest Service constructed 1,180 miles of road. A summary of planned versus accomplished miles can be seen in figure 42. The decrease in purchaser credit mileage is consistent with the decrease in timber sale volume. Purchaser election mileage was less than that planned due to small purchasers requesting the Forest Service to construct fewer timber sale roads than were initially anticipated. Miles of road constructed and reconstructed with Forest Road Program funds were within 22 percent of that planned.

Road construction by State for appropriated funds, purchaser credits, and purchaser election funds are shown in tables 41 and 42.

Although the majority of new roads were initially constructed to access timber sales, these roads are also used to access areas for recreational opportunities such as hiking, camping, hunting, and fishing. Other national forest activities such as firefighting, wildlife habitat improvement projects, watershed projects, grazing allotments, and mineral activities are also benefiting from the construction of new roads.

Based on the Road Analysis and Display System, unit costs for road construction, reconstruction, engineering, and administrative support increased in FY 1992 (see figure 43). The

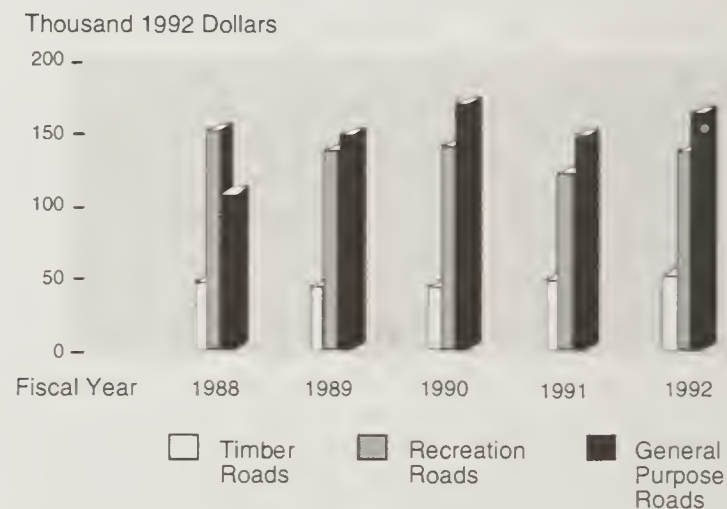
increase in unit costs was mainly due to the increased mileage of higher cost recreation roads, as well as the inability to award prepared road project contracts that were delayed or stopped by litigation.

In cooperation with the forest products industry, each of the following strategies has been applied where appropriate to reduce the dependence on appropriated road funds:

- Increase the use of Salvage Sale Fund collection/expenditure opportunities for road support costs.
- Delay road survey and design until after the timber sale is awarded, to avoid road support costs for timber sales that never sell due to legal and other unforeseen concerns.

Figure 43.

National Summary of Unit Costs for Road Construction and Reconstruction—Total Unit Costs



- Increase the use of purchaser prehaul road maintenance to perform maintenance work which is necessary to remove timber.
- Restrict the public's use of haul roads to reduce the need to reconstruct roads to accommodate mixed timber and public travel.

Bridges

The Forest Service has over 8,000 road bridges on the Forest Development Road System, and approximately 3,000 trail bridges for management of various resources.

In FY 1992, 68 new bridges were constructed, and 86 bridges were reconstructed or rehabilitated. This included 42 bridges having timber as the primary structural component. This continues the Forest Service tradition of working with State and local agencies to promote the use of timber products in rural areas. Bridge construction and reconstruction, by State, with appropriated dollars and with purchaser credit, are shown in table 41.

The Forest Service bridge operation and maintenance program includes regular inspection, load capacity rating, and posting of restricted bridges. This strategy assures the identification of bridges with deficiencies, and bridge replacement costs associated with maintenance of public access to National Forest System lands.

Buildings

The Forest Service owns or leases buildings providing approximately 26 million square feet of space located on 852 administrative units. Twenty-two percent of the buildings are leased.

The appropriation for construction of fire, administrative, and other facilities for FY 1992 was \$8 million while the appropriation for construction of research facilities was \$4 million. The FY 1989 backlog of \$448 million in needed facilities is now estimated to be \$1.010 billion and will continue to grow should funding levels remain constant. In addition to appropriated funds, forests used their minor construction authority to spend other appropriated dollars to renovate and construct buildings.

Maintenance costs for fire, administrative, and other facilities continued to increase as the age of the buildings increased and standards changed. In FY 1992, \$27 million in appropriated funds and \$6 million in rent receipts were spent to maintain buildings.

A major part of the maintenance program in FY 1992 was the identification and removal of asbestos, and the reduction of radon levels to meet health and safety standards. Efforts continued to ensure building accessibility for all people, and to provide equal facilities for both genders. The emphasis on accessibility and equal facilities is a reflection of the Forest Service goal of recruiting and retaining a diverse work force and serving our publics.

In an effort to stretch construction and maintenance funds, the Forest Service is continuing to utilize Job Corps personnel, prison crews, and volunteers to maintain and construct facilities.

Dam Safety Management

The Forest Service owns over 1,000 dams and administers permits for another 2,200 dams owned by others but located on the National Forest System.



A timber bridge on the Monongahela National Forest in West Virginia. FS Photo

Regular dam safety inspections and improvements are an essential part of dam safety management. Cooperative inspections by permittees and State dam safety officials have helped improve the safety of dams. Many owned and permitted dams were modified as a result of these inspections. Inspections, maintenance, and repair of Forest Service dams are funded from the benefiting activity such as recreation, wildlife, and watershed.

Major rehabilitations were completed on seven Forest Service-owned dams in FY 1992 at a cost of \$1.5 million.

The Forest Service Dams Inventory was modified during the year to provide data for the National Inventory of Dams mandated by the Water Resources Development Act of 1986 (P.L. 99-662). The inventory information was provided to the Federal Emergency Management Agency.

Equipment Management

The Forest Service owns and operates approximately 16,000 motor vehicles and 2,000 pieces of specialized equipment.

In FY 1992, the Forest Service and the General Services Administration completed the pilot-testing of an automated vehicle ordering system. The pilot-test was a success, reducing the paperwork and time involved in the motor vehicle procurement process. The electronic process is being expanded to include other agencies.

The Forest Service has participated fully on a task force set up to carry out the Secretary's management agenda item for the effective and efficient management of USDA's motor vehicle and aircraft fleet. Along with membership on the steering committee, Forest Service personnel participated in all six working groups.

Federal Facilities Compliance Program

The Federal Facilities Compliance Program brings Federal buildings and sites into compliance with several laws enacted to protect public health and the environment. The Forest Service has identified 361 projects to bring its buildings and sites up to standard.

In FY 1992, the Forest Service completed 114 projects. Types of projects completed were cleanup of hazardous waste, mine, and sanitary landfill sites; removal, disposal, and cleanup of underground storage tanks; mitigation of asbestos and radon in buildings; and the upgrade of drinking water systems.

Technology and Development in Support of Resource Programs

The Technology and Development Centers at Missoula, Montana, and San Dimas, California, implement promising new technologies in partnership with the National Forest System, State and Private Forestry, Administration and Research branches, other Government agencies, and private industry. The following are selected examples of technologies explored and tested in FY 1992.

Environmental Roads Initiative—This project will provide information to field units about measures that can be taken to mitigate environmental concerns about roadways and areas

adjacent to them. The project considers new construction and reconstruction, as well as roadway maintenance.

Health Hazards of Smoke—The National Wildfire Coordinating Group assigned the task of coordinating ongoing and future studies on the effects of forest fire smoke on firefighters to the Missoula Technology and Development Center. A multiagency technical panel was recently convened to review existing research and identify research needs and priorities.

Fish Passage Through Culverts—Through cooperation with the Federal Highway Administration, the San Dimas Technology Development Center produced a publication and companion video that address various means of providing adequate fish passage through road drainage culverts.

Pollen Equipment—The Missoula Technology and Development Center developed a vacuum collection system that gives orchard managers a means of collecting a large supply of pollen from the crown of designated trees in a quick and efficient manner. The pollen is then cleaned and stored for later application to the target trees during the optimum receptive period.

Sweet-Smelling Toilets—An in-depth design and maintenance manual produced by the San Dimas Technology and Development Center provides the answers to eliminating obnoxious odors in vault and pit-type toilets. All new toilets constructed on national forests will follow the principles spelled out in the manual, while older toilets will be replaced or retrofitted over time to correct the problem.

Mapping and Digital Spatial Data

In FY 1992, the Geomtronics Service Center updated 1,035 Primary Base Series maps (1:24,000 scale) and 35 Secondary Base Series maps (1:126,720 scale). The center completed 2,502 cartographic feature files containing digitized information from base series maps which will be used to accelerate future map revisions and to provide a base for geographic information systems. The center completed 1,924 digital elevation models and generated 2,044 orthophotos for forest planning and resource management use.

Remote Sensing

The integration of remote sensing into resource data collection activities is ongoing. In FY 1992, 57 resource aerial photography contracts were administered for 74 project areas, with 26 new contracts awarded covering 63,480 square miles. The Forest Service is one of six Federal agencies that serve on the steering committee of the National Aerial Photography Program, a program established to coordinate the acquisition of aerial photography over the United States every 5 years.

Image processing of remotely sensed data is increasing within the agency due to changing requirements for information. Land management planning and changing resource issues require rapid updates to resource information which can be provided by remote sensing. The global positioning system is a rapidly developing technology that is revolutionizing field survey methods and has agencywide potential uses. By the end of FY 1992, over 500 global positioning units were in operation on the National Forest System and 20 base stations were administered by the Forest Service.

INTRODUCTION

State and Private Forestry programs and projects advance the Forest Service's mission to steward the sound management, protection, and use of more than 600 million acres of forested land in the United States that falls outside the boundaries of the National Forest System. The program serves as a link between many public and private organizations, and bridges ownership and organizational boundaries to promote the best use of America's natural resources. State and Private Forestry programs are guided by the direction provided in the Cooperative Forestry Assistance Act, the 1990 Resources Planning Act, and the Food, Agriculture, Conservation, and Trade Act of 1990 (1990 farm bill). The Cooperative Forestry Assistance Act of 1978 was amended by the 1990 farm bill (Title 12).

Stewardship of America's natural resources is achieved in cooperation with State foresters; other State and Federal agencies; officials in cities, counties and towns; and academic institutions. State and Private Forestry continues to carry out its work plan through the five emphasis areas identified in the November 1991 RPA planning meeting with State foresters, various American Indian tribes, and other key State and private cooperators. These five emphasis areas are: multiresource management and stewardship, forest health and protection, rural America, urban and community forestry, and natural resource conservation education.

Table 44 compares State and Private Forestry FY 1992 appropriations with long-term projected costs from the 1990 Resources Planning Act Program, and Table 45 displays FY 1992 appropriations along with FY 1988-91 appropriations. Table 46 compares FY 1992 accomplishments with long-term projections of accomplishments from the 1990 RPA Program.

COOPERATIVE FORESTRY

Forest Management and Utilization

The Forestry Title of the 1990 farm bill contains a nationwide, multiyear program of tree planting and forest improvement through 1995. The tree planting program is implemented through both rural and urban components that plant, improve, and maintain trees in communities and rural areas across the Nation. The Forest Stewardship and Stewardship Incentive programs comprise the rural component, and the Urban and Community Forestry program comprises the urban component. These programs stress environmental education to improve public awareness and understanding of the benefits and needs of trees and forest cover in rural and urban areas.

Forest Stewardship Program and Stewardship Incentive Program

The Forest Stewardship program provides technical assistance to landowners to encourage the long-term multiple-use management of nonindustrial private forest lands. The program goal is to develop management plans for 25 million acres by 1995. The Forest Service works with private landowners to develop multiple-resource management objectives such as timber production, fish and wildlife habitat enhancement, water quality improvement, and forest recreation enhancement.



An interagency team reviews a landowner's forest stewardship management plan in Kentucky. FS Photo

The Stewardship Incentives program provides financial assistance to landowners to help implement the forest management objectives identified in the stewardship plan. Eligible landowners may be reimbursed for up to 75 percent of the cost of implementing stewardship practices.

Accomplishment highlights include:

- Implemented the Stewardship Incentive program under the interim rule with funding made available to all States and Territories. Received landowner applications for Stewardship Incentives program practices beginning on February 3, 1992.
- Reviewed the Forest Stewardship program and Stewardship Incentives program in all 50 States and 3 Territories.
- Provided assistance in the development of 21,219 stewardship plans encompassing 1,729,114 acres nationwide. Since the inception of the program, 43,998 plans have been developed on 3,672,305 acres. (See table 47.)
- Planted an estimated 46.8 million trees.

Urban and Community Forestry

Under the provisions of the Cooperative Forestry Assistance Act of 1978, as amended by Section 1219 of the 1990 farm bill, this program promotes the improvement of the economic, environmental, and social well-being of communities through the planting and care of trees, shrubs, and other vegetation. The Forest Service vision is to have sustained, healthy trees and forests in cities, towns, and communities across the United States that contribute to the well-being of the people who live and work there, and that help improve the soil, water, and air quality in these areas.



"Trees Around the World," 1992 Arbor Day tree planting at the National Arboretum, Washington, DC. FS Photo

Accomplishment highlights include:

- Technical and financial assistance for tree planting and care was provided through State forestry agencies to almost 14,000 communities.
- In cooperation with its State forestry partners, the Forest Service conducted reviews of Urban and Community Forestry programs in all 50 States, the District of Columbia, and the South Pacific Islands (American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands). Reviews indicated that the Urban and Community Forestry program was on track across the Nation.
- The National Urban and Community Forestry Advisory Council was appointed by the Secretary of Agriculture and began to work on its mandates to develop a national urban and community forestry action plan, evaluate the implementation of that plan, and develop criteria and submit recommendations for the challenge cost-share program.
- The U.S. Landscape Tree Planting Survey was completed. This comprehensive study of 840 companies involved in growing landscape trees for our Nation's cities, communities, and residences was conducted by the National Gardening Association and funded jointly by the American Association of Nurserymen and the Forest Service. Data gathered will be used to develop a trendline to guide future community tree planting efforts.
- The feasibility of using airborne videography, a new type of infra-red videography, to inventory and monitor urban forest structure and health is being evaluated in a joint project funded by Cooperative Forestry and Forest Service Research. This study will complement other aspects of a Chicago Urban Forest Climate Project aimed at developing new methods to quantify the environmental benefits and costs of urban forests.

- In partnership with the Cole Coalition, an ethnically diverse organization of concerned residents, businesses, service providers and government agencies in Denver, Colorado, Cooperative Forestry provided \$10,000 to develop a video documenting community efforts to utilize tree planting as part of their community improving and healing endeavors.
- The Fifth National Urban Forestry Conference was held in Los Angeles, California. Nearly 1,000 attendees from the public and private sectors, including students, volunteers, urban and community forestry professionals, and nursery and tree care industry representatives, participated in workshops ranging from the biology of city forests to partnerships for community improvement through tree planting and care.
- A pilot training program for Urban Forestry Tree Care Workers and Tree Climbers was initiated at the Golconda Job Corps Civilian Conservation Center in southern Illinois. This program, the result of a partnership between the Forest Service, the Department of Labor, and the International Society of Arboriculture, will provide technical training to participants, mostly minorities, in tree care and maintenance procedures. The goal of the program is to create employment and career opportunities in the tree care profession.
- Three exhibits have been developed for use at national organization conventions and conferences to disseminate urban and community forestry information.

Treecover L.A. (Los Angeles)

The Forest Service developed two programs, Opportunity L.A. and Regreen L.A., to help Los Angeles recover from the April riot. For more specific information on the accomplishments of these two programs, refer to page 86 of this report.

Rural Community Assistance

In FY 1992, the Forest Service continued implementation of the President's initiative on rural development through coordinated efforts with the new USDA Rural Development Administration and State Rural Development Councils. The agency also moved ahead with the implementation of its own strategy, "Working Together for Rural America," a key goal of which is to actively participate in planning and implementing community-based rural development activities. This approach consists of three major components: rural development; economic recovery; and economic diversification studies.

Appropriations in the economic recovery program in FY 1992 supported activities designed to implement Title 23, Subtitle G, of the 1990 farm bill. Activities included assisting eligible communities to organize action teams, develop local action plans, and implement their plans through cost-sharing and other methods. A summary of economic diversification studies is displayed on page 66 of this document.

Accomplishment highlights include:

- Held regional rural development workshops in the South, West, and Northeast to build understanding about the servicewide strategy.
- Conducted a National Rural Development Coordination Meeting for national and field coordinators, National Association of State Forester's (NASF) Rural Development Committee, National Forest field representatives, and key Washington Office staff.

Economic recovery program accomplishments include:

- Developed and released guidelines for implementing the "National Forest-Dependent Rural Communities Economic Diversification Act of 1990" of the 1990 farm bill (Title 23, Subtitle G, Chapter 2).
- Organized or certified 171 Local Action Teams in rural communities, thereby assisting 185 towns and counties in economic transition.

Rural development program accomplishments include:

- Supported more than 57 individual cooperative projects involving State agencies, local governments, the nonprofit sector, Indian tribes, and local businesses.
- Provided support for projects ranging from the development of a new business in McGregor, Minnesota (population 800), to working with the community of Berlin, New Hampshire (population 12,200), to plan for the diversification of its natural-resource-based economy.
- Redirecting existing programs to focus more on economic diversification using natural resources in rural America.
- Established a formal liaison position with the National Association of Counties to work on rural-development-related matters.
- Organized new partnership efforts with the Bureau of Economic Analysis and the Economic Research Service for the review and analysis of information pertinent to issues and needs in rural America.

Wood Utilization

In FY 1992, this program was refocused on three national priority issues: forest-products-based economic development, forest products conservation, and recycling. The program name will change to Forest Products Conservation and Recycling in 1993.

During FY 1992, a national Forest Products Conservation and Recycling Strategy (FPC&R) was initiated. The strategy contains five goals: increased forest-based economic opportunities, reduced impact of utilization activity on the environment, increased understanding of forest values and applications among forest managers, reduced wood fiber in landfills, and extended useful life of forest products.

Accomplishment highlights include:

- Completed revision of USDA Agriculture Information Bulletin No. 278, "Special Forest Products for Profit."
- Completed development and initiation of a model for re-orienting how the Forest Service identifies customer needs and works to meet them by modifying existing technologies or developing new technology.
- Expanded the linkage with existing partners and initiated new ones to begin to explore ways to economically utilize arboricultural and nonforestry wood wastes.
- Funded 19 studies aimed at helping minimize economic distress in Pacific Northwest communities resulting from the dramatic reductions in timber harvest levels in Oregon and Washington. Total funding was \$760,000 in specially earmarked funds. Final results and implementation will take place during fiscal years 1993 and 1994.
- Continued training and information programs in sawmilling efficiency and quality control by providing over 400 software packages for improved wood processing and quality control, four training sessions, and development of three new computer programs for controlling and evaluating lumber processing operations, a user's guide, and training manuals.
- Continued distribution of 11 monthly issues of the Forest Products Conservation and Recycling (formerly Utilization and Marketing) Newsletter to over 700 cooperators and users of Forest Service technology.

National Timber Bridge Initiative

The primary objectives of the National Timber Bridge Initiative in FY 1992 continued to be "...diversify local economies by improving rural transportation networks; expanding the range of markets for wood products; and creating service industries for wood construction." This direction is being achieved through four components: Demonstration Timber Bridges; Research; Technology Transfer and Information Management; and Rural Revitalization.

Accomplishment highlights include:

- Completed construction of 32 Demonstration Timber Bridges in 1992 for a total of 116 Demonstration Timber Bridges constructed from 1989 through 1992.
- Forest Service Research evaluated innovative bridge designs under laboratory and field conditions, developed new design criteria for yellow poplar and red maple, evaluated wood guard-rail systems, established research plans in cooperation with the Federal Highway Administration and Iowa State University, and continued research cooperation with eight universities on timber bridge design criteria.
- With Research, led an effort to revise National Design Standards for bridges to permit use of timber in more applications and cooperated with the American Association of State Highway Transportation Officials in implementing them.



Growing tropical hardwoods in Puerto Rico at the Cambalache Nursery. FS Photo

- Formed linkages between the Timber Bridge Information Resource Center and the Rural Transportation Assistance Program of the Federal Highway Administration.
- Expanded the scope of the initiative by funding seven special studies or projects, demonstrating how advanced wood designs may be utilized for improving surface, marine, and railroad transportation infrastructures.
- Held 13 Timber Bridge Conferences to link wood bridge technology with local governments and manufacturers.
- Increased technology transfer through distribution of the newsletter "Crossings" to 4,000 representatives of State and local governments, industry, and professional organizations while providing more than 10,000 brochures and related technical information on timber bridges to interested parties.

Forest Resource Management Program

Fifty-seven percent of the Nation's commercial timberland is in small private ownerships. Working with State foresters, the Forest Resource Management program provides technical assistance and information to small woodland owners to provide a variety of benefits and services to landowners and the public while protecting soil, water, and other resources through use of sound management practices.

Soil and Water

Through the Forest Resource Management program, the Forest Service provides technical assistance to State foresters in soil and water. Current emphasis is on controlling nonpoint source pollution and managing forested wetlands.

Accomplishment highlights include:

- Assisted State foresters with issues relating to Section 404 Dredge and Fill permitting requirements, application of the Storm Water Regulations to forestry, and Management Measures Guidelines for the Coastal Zone Management Act.
- To clarify the degree to which private forestry activities are exempted from regulatory controls under Section 404 and Storm Water regulations, the Forest Service and State foresters cooperated in conducting tours for representatives from regulatory agencies in the lower Mississippi valley and on the Mid-Atlantic coast.

Forest Taxation Information

The Forest Service provides taxation information to private forest landowners to assist them in planning for their financial future. Three taxation workshops were presented in the Pacific Southwest and Idaho to assist timber-dependent communities, and a cooperative research effort was undertaken to analyze the Federal estate and gift tax laws as they relate to nonindustrial woodland ownership and forest resource management.

Seedlings, Nurseries, and Tree Improvement

This cooperative Federal-State program provides technical and financial assistance to State forestry programs to benefit nonindustrial private forest landowners. Funds are used to train personnel in state-of-the-art nursery management and tree improvement techniques and to implement these techniques on the ground. The program helps produce high-quality, genetically improved tree seed and planting stock to improve productivity of forestlands.

Accomplishment highlights include:

- An estimated 1.3 billion tree seedlings were produced and planted.
- Approximately 50 percent of these seedlings were planted on 1 million acres of State, local government, and nonindustrial private lands.
- Produced several major technical assistance publications, including the "Container Tree Nursery Manual," a leading reference; "Tree Planter's Notes," an applied journal on reforestation; and the annual "Tree Planting Report," the most complete compilation of tree planting data in the country.
- Took a leading role with the Organization for Economic Cooperation and Development in revising the import/export international trade scheme strategy to better meet members' needs.

Forestry Incentives

The Forestry Incentives program and the forestry component of the Agricultural Conservation program administered by the Agricultural Stabilization and Conservation Service, with technical responsibility for forestry activities assigned to the Forest Service and State foresters, are important cost-share programs promoting forestry on nonindustrial private forestlands. Together, these programs account for a significant percentage of all reforestation on nonindustrial private forestlands.



Reviewing on-site conditions and management objectives prior to planting trees. FS Photo

Accomplishment highlights include:

- The Forestry Incentives program was responsible for planting trees on 146,031 acres and accomplishing timber stand improvement on 27,622 acres.
- The Agricultural Conservation program was responsible for planting trees on 102,853 acres and accomplishing timber stand improvement on 29,988 acres.

Cooperative Watershed Activities

The Forest Service cooperates with the Soil Conservation Service in several programs authorized by the Watershed Protection and Flood Prevention Act.

Accomplishment highlights include:

- Provided expertise and information in 53 river basin studies and 73 watershed planning projects to help find solutions to local problems.
- Arranged for State forestry organizations to provide technical assistance to landowners on 30 small watershed projects. Technical assistance was also provided to 1,371 landowners for the installation of land treatment measures on 16,601 acres.
- Participated in five flood prevention projects. In cooperation with State forestry organizations, technical assistance was provided to 1,853 landowners and watershed conditions were improved on 5,680 acres of forest and rangeland.



Forest management demonstration practices prevent soil loss on the Rio Abajo State Forest and are useful for watershed planning on the La Plata River watershed. Photo by Elizabeth Crane

Resource Conservation and Development

The Forest Service is responsible for helping the Department of Agriculture carry out the Resource Conservation and Development program administered by the Soil Conservation Service.

Accomplishment highlights include:

- In addition to assisting with projects, the Forest Service provided technical assistance to Resource Conservation and Development Councils in a variety of forest-related areas.
- Forestry projects undertaken include waste and wood recycling assistance, agroforestry using angora goats, computer-aided design program for modern timber bridges, and international agriculture and special forest products marketing.

FOREST PEST MANAGEMENT

Forest Pest Management provides protection from insects and diseases on all Federal and non-Federal forest lands. Pest management prevention and suppression project activities protect timber resources, recreation areas, wildlife habitats, and watersheds.

National total program expenditures were \$69 million—\$52 million in Federal funds and \$17 million in State and other funds. Federal funds supported all program and suppression activities on Federal lands plus 34 percent of program activities and 57 percent of suppression activities on State and private lands. State funds supported the balance of cooperative program activities and State, county, private, and other funds supported the suppression activities.

Forest pest management activities on the National Forest System were previously discussed.

Surveys and Technical Assistance

The Forest Service provided technical and funding assistance to State forestry organizations in detecting and evaluating vegetation damage or pest populations on 499 million acres of State and private lands. The Forest Service surveyed 44 million acres of Federal lands, other than the National Forest System. Survey findings, along with recommendations and advice about suppression needs and available alternatives, were provided to the managers of the affected lands.

Accomplishment highlights include:

- Implementing a nationwide forest health monitoring system to detect and report unusual changes in forest conditions, determine the cause, and predict the consequences sufficiently to develop management actions to protect the Nation's resources.
- Completed an extensive assessment of introducing exotic forest pests into North America by importing unprocessed logs from New Zealand, in response to a request by the USDA Animal and Plant Health Inspection Service.

Pest Outbreak Prevention and Suppression

Pest suppression projects protected an estimated 641 million cubic feet of merchantable timber on all lands. In addition, an estimated 46 million cubic feet of insect-infested timber was salvaged.



Adult male gypsy moth. FS Photo

Accomplishment highlights include:

- The gypsy moth continues to affect trees in the generally infested area and expand into new areas. The Forest Service helped State agencies with projects on 844,400 acres of State and private lands in Delaware, Maryland, Massachusetts, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Virginia, and West Virginia. Overall, treated acreage was down 60,700 acres from the 905,100 acres treated in FY 1991.
- On Federal lands other than the National Forest System, 19 suppression projects were conducted on 54,900 acres in Maryland, Pennsylvania, and Virginia — a decrease of 2,200 acres from the 57,100 acres treated in FY 1991.
- Conducted or participated in eradication projects to prevent the gypsy moth from becoming established in new areas. In FY 1992, treatment acreages were 74,500, including 9,100 acres of National Forest System lands in Utah.
- Cooperated with the USDA Animal and Plant Health Inspection Service to eradicate the Asian gypsy moth from 135,600 acres in Oregon (8,400 acres) and Washington (127,200 acres).
- Assisted State managers in suppression of southern pine beetle on 18,000 acres of State and private lands, and assisted other Federal managers on 26,700 acres of non-Forest Service Federal lands. Suppression activities protected about 51 million cubic feet and salvaged an additional 25 million cubic feet of pine timber.
- Mountain pine beetle suppression occurred on 500 acres of State and private lands, and 700 acres of non-Forest Service Federal lands. Approximately 2.6 million cubic feet of timber were protected, and an additional 0.4 million cubic feet of timber was salvaged.

Pest Management Special Projects

Accomplishment highlights include:

- FY 1992 was the last year of the 5-year Appalachian Gypsy Moth Integrated Pest Management Demonstration Project, whose purpose was to evaluate the ability to slow the spread of the gypsy moth and to reduce its negative impacts.
- Developed an operational system for dispensing pheromone flakes, eliminating many previous application problems.
- Used the Swath Kit, a portable computerized system, to characterize all spray aircraft used against the Asian gypsy moth. The kits are used by some States and private companies as well as Canada, the USDA Animal and Plant Health Inspection Service, and the Forest Service.
- Early indications of FY 1992 trials suggest the effectiveness of reduced dose rates for Dimilin and *Bacillus thuringiensis* (Bt). If the final data warrants, new application rates will be recommended.
- An evaluation of three ready-to-use formulations of GYPCHEK showed that all three are as efficacious as the current formulations, but much easier to mix and apply.
- Continued participation in the National Agricultural Pesticide Impact Assessment Program. In FY 1992, 20 projects were conducted to improve our knowledge of the risks and benefits of using pesticides in forestry. Studies concentrated mostly on the fate of pesticides in the environment.

Forest Health Monitoring

The goal of the Forest Health Monitoring program is to detect and report changes in forest conditions in the United States, and to coordinate an evaluation of these changes at the multistate level.

Accomplishment highlights include:

- Remeasured plots established in New England in FY 1990, and in FY 1991 in New Jersey, Delaware, Maryland, Virginia, Georgia, and Alabama. Plots were established and measured for the first time in California and Colorado.
- Worked through the North American Forestry Commission to harmonize forest health monitoring data collection procedures and analysis with counterparts in Mexico and Canada.
- Released annual report of the North American Sugar Maple Decline project. The overall health of sugar maple in North America is improving, except in parts of the Lake States seriously affected by a previous drought.

SPECIAL PROJECTS

Lake Tahoe Erosion Control Program (Burton-Santini Act)

Because of concerns by the States of California and Nevada over declining water quality, Congress provided for the establishment of the Tahoe Regional Planning Agency in 1969, and

enacted the Burton-Santini Act (P.L. 96-586) in 1980. This project implements provisions of the Act and supports the goal of improving water quality by providing funds for erosion control on non-Federal lands within the Lake Tahoe Basin. During FY 1992, the Secretary of Agriculture granted \$0.9 million for 11 new soil erosion and water pollution control projects in the Lake Tahoe Basin. These Federal funds were matched by \$1.5 million in State and local funding. Six projects were completed, with an estimated 13,500 fewer tons of sediment lost.

Walla Walla Trail

In FY 1992, funding of \$123,000 was provided for the second phase of construction of the Walla Walla Trail.

Old-Growth Diversification

Old-growth diversification encourages value-added wood processing manufacturing in timber-dependent communities in Oregon and Washington. In FY 1992, Congress directed that the States of Oregon and Washington receive grants of \$977,000 each. A 50/50 match is required by States in use of these grant funds.

Washington—In FY 1992, the Washington Department of Trade and Economic Development added the \$977,000 grant to the Revolving Loan Fund created in FY 1991, aimed at fostering value-added manufacturing in small and medium-sized forest products firms throughout Washington.

Oregon—In FY 1991, funds were passed to the Oregon Economic Development Department. The entire grant, \$980,000, was transferred to the City of Springfield, Oregon, for renovation of the Booth-Kelly Center, a facility which originally housed an old-growth sawmill.

The Northern Forest Lands Council

In FY 1988, Congress directed the Forest Service to study the effects of ownership and management changes on large tracts of forested lands in northern New England and New York. The Governors of Maine, New Hampshire, Vermont, and New York set up a task force to work with the Forest Service on the study. A final report, released in May 1990, identified and assessed the forest resources, landownership patterns, social and economic changes, and strategies necessary to meet study objectives. In response to the final report, the Governors established a Northern Forest Lands Council in FY 1991, of which the Forest Service is a member.

Accomplishment highlights include:

- Promoted Citizen Advisory Committees in each State.
- Assisted the Council in forming Subcommittees of the Council to address major issues in: Land conversion; property, State, and Federal taxes; local forest-based economy; biological resources; recreation/tourism; public conservation strategies/public acquisition; resource inventory; public involvement; and administration.

Forest Legacy Program

Authorized in the Forestry Title of the 1990 farm bill, the Forest Legacy Program is a conservation easement program aimed at identifying, protecting, and managing environmentally important forestlands that are threatened by conversion to nonforest

uses. For the "willing landowner," the program provides an incentive tool to help steward important forest areas. Integral to that objective is the safeguarding of private landowners' property rights.

Accomplishment highlights include:

- Began implementation in all six of the targeted States (New York, New Hampshire, Vermont, Maine, Massachusetts, and Washington) based on the new program guidelines.
- Established a program coordinator position to oversee the implementation of the program in the Northeastern States.
- Developed Forest Legacy committees and partnerships in each of the six States to identify potential properties that meet State program goals and objectives.
- Prepared, in conjunction with the USDA Office of General Counsel, a memorandum of understanding which will be executed between the Forest Service and the lead agency of a participating State to define respective roles and responsibilities.
- Reviewed Assessment of Need documents for the States of Massachusetts and Washington.
- Identified five geographic areas in the State of Washington for designation as Forest Legacy areas.

Economic Diversification Studies

Congress appropriated \$543,000 for continuing the Economic Diversification Studies program in FY 1992. Since the program began in FY 1989, the Forest Service has cost-shared 49 studies in 20 different States. The program is intended to help rural communities identify options for diversifying local economies affected by Federal legislation or changes due to resource management decisions.

In FY 1992, Congress earmarked program funds totaling \$60,250 for two projects in Washington State. Beyond this, the Forest Service cost-shared 11 studies in 10 different States with other Federal, State, and local governments (Alaska, Arkansas, California, Florida, Montana, New Mexico, Oregon, Utah, Washington, and West Virginia).

Accomplishment highlights include:

- Granite, Powell, and Anaconda Counties, Montana. A multicounty study is being done to provide for comprehensive planning and economic diversification of the region via value-added and wood waste products; nonforest-based products and services; and new markets.
- Madera County, California. A study to explore ways the North Fork and Sierra Mono Tribes can produce value-added products or by-products from their mill through small or cottage industries.
- Liberty County, Florida. A study to identify opportunities to promote economic diversification and revitalization of the local economy.

- Garfield County, Utah. A study to identify nonforest-dependent resources which provide opportunities to create economically viable communities.

The New York-New Jersey Highlands Regional Study Report

In FY 1991, Congress provided \$249,000 to study and recommend alternative conservation strategies that would protect the dwindling forest resources in the New York/New Jersey Highlands region, which includes the 18,999-acre tract called the Sterling Forest. This study, submitted to Congress in the fall of 1992, focused on options for conservation strategies for the Highlands region to protect the water supply for 4 million city dwellers while conserving forests, wildlife habitat, and open space critical to the quality of life and economic prosperity of the region.

The Chesapeake Bay Program

The Chesapeake Bay Program is designed to demonstrate how properly managed natural resources can protect critical environmental resources and, with emphasis on water quality, contribute to a stable economy. The 5-year plan, "Forestry and the Chesapeake: An Environmental Quality Initiative," has six objectives to improve the quality of life throughout the Bay watershed: information management, education, stewardship, rural economic well-being, urban/rural interactions, and technology transfer.

Natural Resource Conservation Education Program

The primary objective of the Natural Resource Conservation Education Program is to support a lifelong learning process that promotes the understanding of natural resources and ecosystems, their interrelationships, conservation, use, management, and values to society.

Accomplishment highlights include:

- Established over 15 partnerships at the national level with natural resource management Federal agencies and private organizations.
- A FY 1992 Chief's commitment of \$2.5 million was leveraged with other Federal, State, and local agencies, schools, and private industry to support and fund over 150 projects nationwide representing a wide spectrum of activities.
- Projects for FY 1992 included Project Learning Tree; Investigating Your Environment; Urban Treehouse; Wider Opportunities with the Girl Scouts of USA; and Trail Boss, Jamboree, and Order of the Arrow with the Boy Scouts of America.

The Pinchot Institute for Conservation Studies

The Pinchot Institute for Conservation Studies is located at Grey Towers National Historic Landmark in Milford, Pennsylvania. Grey Towers was the home of Gifford Pinchot—pioneer conservationist, first Chief Forester of the Forest Service, and Pennsylvania Governor. Conservation leadership and land ethics were the primary program areas for the Pinchot Institute for Conservation Studies. The Institute:



Grey Towers National Historic Landmark in Milford, Pennsylvania. Home of Gifford Pinchot, first Chief Forester of the Forest Service.

FS Photo

- Funded a Grey Towers fellow to research and speak on "Leadership and Land Ethics for the Forestry Profession."
- Sponsored a leadership round-table involving natural resource professionals to define and discuss leadership for natural resources.

Mercer County Hardwood Machinery Training Center

In FY 1992, \$9 million funding was finalized for the construction of a Hardwood Manufacturing Technology Center in West Virginia. The center is a joint effort between public, private, and academic interests to establish a facility where newly developed and developing manufacturing technologies can be researched, designed, applied, and implemented to expand America's machine manufacturing base for the secondary hardwood manufacturing industry.

COOPERATIVE FIRE PROTECTION

Wildfire Prevention

A strong prevention program is critical to effective wildfire management, and the Forest Service took steps to modernize its prevention efforts during FY 1992. Integral to this effort is increased emphasis on interagency partnerships and project participation.

The Cooperative Forest Fire Prevention Program, which centers around the popular Smokey Bear symbol, produced an extensive, highly recognized public service advertising campaign in FY 1992. Preparations for Smokey Bear's fiftieth anniversary as the Forest Service's firefighting symbol (October 1993 - August 1994) have begun. This event will emphasize the need to decrease the number of unwanted, human-caused wildfires in America's forests and rangelands.

Wildland/Urban Fire Prevention/Protection

Over the past 30 years, increasing numbers of primary and secondary homes have been constructed in the wooded portions of the country, causing a growing fire protection issue in the wildland/urban interface area. In 1986, the Forest Service joined with the U.S. Fire Administration in the Wildland Urban Interface Fire Protection Initiative. Efforts to reach city and county planners, developers, architects, and landscape designers as well as insurance companies with information on safety from wildfire took place in FY 1992.

Cooperative Fire Protection

The primary objective in FY 1992 was to promote the cooperative fire planning concept, process, and program by enhancing the information and coordination skills within the Forest Service, States, and volunteer fire departments. Actions centered around six basic program delivery areas: information, analysis and planning, technology development, technology transfer, shared protection resources, and efficient State protection.

The Forest Service provided national leadership to the Federal Excess Personal Property program, acquiring and loaning \$54 million worth of excess property to States, and providing management for the 232 fixed and rotary wing aircraft, 23,000 vehicles, and many pumps, generators, and compressors currently on loan to the States.

The Forest Service provided support to the National Association of State Foresters with fire suppression program assistance on State and private lands. Regional cooperative fire protection plans were also updated to improve the effectiveness and delivery of State fire protection programs.

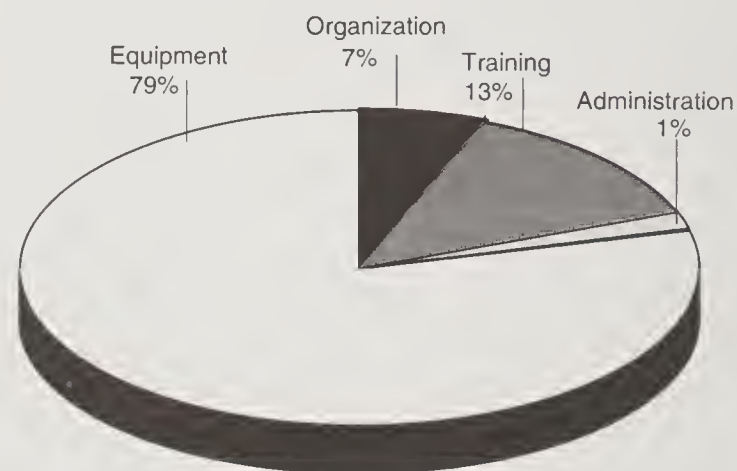
Through the Farmer's Home Administration appropriation, the Forest Service administers the Rural Community Fire Protection program. This program makes funds available for planning, organizing, equipping and training rural fire departments serving communities with populations of less than 10,000. Figure 44 shows how cooperators used the \$3.5 million Federal share. In FY 1992, State foresters approved 3,777 applications from communities in all 50 States and 3 Territories.

Hurricanes Andrew and Iniki, and Typhoon Omar

The Forest Service, as part of the Federal Emergency Management Agency's Catastrophic Disaster Response Group, provided national leadership and guidance in support of the response to Hurricanes Andrew and Iniki, and Typhoon Omar. National Incident Management Teams were dispatched to Florida, Louisiana, and Hawaii to operate mobilization centers and staging areas, assist in general logistical support, and develop incident action plans.

Figure 44.

Rural Community Fire Protection—Forest Service Assistance to Local Organizations—FY 1992



Farmers Home Administration Appropriation - Total: \$3.5 Million



FS Photo

ACTION TOWARDS SUSTAINABLE DEVELOPMENT OF THE WORLD'S RESOURCES

Responsibility for global stewardship is shared by the entire Forest Service. This takes the form of setting an example with sustainable management of the National Forest System, research with implications for global forest management, or actually sharing resource management experience with others in the world.

International forestry activities captured a lot of attention in the Forest Service in FY 1992. Developing a common consensus of work for the new International Forestry deputy area was the focus for the first year. In addition, keeping up with work in existing programs and taking advantage of a dramatically changing world challenged the capabilities of the agency.

The International Forestry Mission

Building on the Forest Service mission statement as a guide, the Deputy Chief for International Forestry involved a broad spectrum of Forest Service personnel and external cooperators in developing a plan of work for the the new deputy area. It states that:

The Forest Service, through cooperative efforts with other countries, promotes the sound management and conservation of natural resources to meet human needs while protecting environmental quality.

Development of the International Forestry Deputy Area

The new deputy area is organized into two staff areas: Policy, Planning and Liaison, and Geographical and Technical Operations. Prior to advancing this organizational proposal, the deputy area worked with its major partners, particularly the U.S. Agency for International Development (USAID), to assure adequate service to customers.

Identifying Priorities for International Forestry

The modest resources available to the Forest Service for international programs requires that the agency establish priorities to maximize the effectiveness of its international efforts. A concept of targeting the allocation of resources through "focused" and "flexible" programs has been adopted. Specific geographic areas containing forest ecosystems of global significance fall into a "focused" category. Nations within these major forest ecosystems are targeted for long-term programs designed to support sustainable forest management assistance. The "flexible" program provides for capturing unforeseen opportunities and establishing shorter term involvement with other nations. Flexible projects might include projects to advance scientific understanding, responses to natural disasters, or cooperative initiatives with other partners that foster mutually identified objectives.

Two major forest ecosystems, Amazonia and the humid tropical forest area shared by Mexico, Guatemala, and Belize, were identified as initial "focus" areas for Forest Service involvement.

Primary objectives of Forest Service international activities are: (1) protection and conservation of forest resources; (2) increased understanding of forest ecosystems; and (3) the sustainable management of forests for the benefit of people. Specific goals for individual "focus" programs will be developed in conjunction with the national institutions in the affected countries.

A Framework for Decisions

Forest Service international forestry efforts are a multideputy responsibility coordinated by the International Forestry deputy area. To assure effective program action, two mechanisms have been established to assure regular coordination of international activities. An interdeputy area work group will provide coordination and assistance in priority-setting. The interdeputy work group is comprised of the Associate Deputy Chiefs of each deputy area. In its first meeting the group addressed the selection of "focus" countries and confirmed the roles of the deputy areas in the execution of major international programs.

Identification of accountable Forest Service officials for "focus" programs clarifies final authority for Forest Service international activities in specific countries. Since long-term "focus" programs within any given nation will draw upon agency skills, the designation of a senior official to provide program direction will reduce conflicts and duplication of efforts.

Sister Forests

On August 3, 1992, approval was given for the creation of a Sister Forests Pilot Program as a means to engage a broader spectrum of field personnel in international technical exchanges. Five Sister Forests pairings have been approved for initial efforts in the pilot program. Three of these pairings began as vehicles to improve habitat management for neotropical migratory birds, yet all five have since expanded to multidisciplinary endeavors. Participating forests are:

- Lewis and Clark National Forest and the Forestry Department of Belize
- Cibola National Forest and the Monts Mandingues Forest in Mali
- Klamath National Forest and the El Triunfu Reserve in Mexico
- The National Forests of North Carolina/Cherokee National Forest and the John Crow Forest Reserve in Jamaica
- The National Forests of Texas and the Darien Biosphere Reserve in Panama

Other Major Initiatives

The Forest Service had the opportunity to make significant contributions to the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro this past June as part of the United States delegation to the conference. Guidance for agency followup to UNCED consists of Forest Service implementation of an ecosystem approach to forest management, expanding activities in international forestry, and linking Forest Service UNCED obligations to strategic and land management planning.

Based on Forest Service contributions made to U.S. efforts at the UNCED, the agency is now playing a prominent role in the development of the President's "Forests for the Future" initiative. The initiative is a commitment made by former President Bush at UNCED to double U.S. foreign assistance to international forestry.

The Forest Service has accepted a role as convener of the organizations in the Washington, D.C., area with interests in international natural resources management. Two meetings of this "community of interests" group were convened in FY 1992. Over 50 senior-level representatives of government agencies, multilateral organizations, and nongovernmental organizations participated in each meeting. The group identified key issues to be addressed in the international section of the 1995 Resource Planning Act Assessment and Program. A dialogue was also started on coordinating the U.S. response to UNCED.

FY 1992 marked the decision to create the International Institute of Tropical Forestry in Puerto Rico. In line with the mandate from UNCED, the institute will elevate the Forest Service profile in the Western Hemisphere and improve agency capabilities to support sustainable natural resources management in the Tropics. A team began work on reorganization in the fall and the Department of Agriculture's approval of the new administrative structure was celebrated on December 7, 1992, in San Juan, Puerto Rico.

Forestry Support to the U.S. Agency for International Development

Implementation continues on the 10-year Forest Resource Management II project with USAID that began in 1991. The 10-year, \$45 million project is a joint activity between the Agency for International Development, the Forest Service, the Peace Corps, the USDA Office of International Cooperation and Development (OICD), and forest-based enterprises in the forestry sector. The project is designed to promote and strengthen the capacity of forestry and natural resources management institutions in tropical and subtropical countries through the mobilization of the public and private professional forestry and natural resources management community in developing countries. It was carried out through the forestry support program of International Forestry.

During FY 1992, more than 70 technical advisers were provided to USAID. Technical assistance supported a range of on-going field projects in Africa, Central and South America, and Asia. Technical backstopping was also provided to USAID's 173 forestry projects and 115 biological diversity projects around the world.

Highlights of the Forestry Support Program in FY 1992 were:

- A program evaluation by a USAID-contracted team which analyzed the depth and breadth of Forest Service technical assistance. The team suggested increased funding by USAID to the Forest Service over the remaining 8 years of the Forest Resources Management Project (FRM II), and recommended expanding the focus from just tropical forests to include temperate and boreal forests of the former Soviet Union and Eastern Europe.

- Publication of the proceedings of a workshop on Financial and Economic Analysis of Agroforestry Systems. The workshop, the first truly international workshop held in this subject area, addressed the identification and dissemination of methodologies to determine the financial returns to landowners from the adoption of agroforestry systems.
- Expanded collaboration with the Peace Corps (with joint activities in Africa, Asia, and South America).
- Pioneered environmental analysis work in Latin America on behalf of the USAID Latin American and the Caribbean Bureau.
- Conducted field environmental analysis of the Melanesian Sustainable Forestry Program in Papua New Guinea, Solomon Islands, and Vanuatu in cooperation with USAID.
- Assisted USAID with the development of a Women in Development Workshop in Pakistan, following up on earlier forestry support efforts in Central America and Africa.
- Proposed an "International Forestry Apprentice Program" to provide a mechanism for agency technical experts without prior international experience to undertake field assignments alongside more seasoned specialists working on behalf of USAID missions.



Exchanging ideas in the Dominican Republic. Photo by Susan Huke

Disaster Assistance Support to the U.S. Agency for International Development

The Disaster Assistance Support Program continues to provide emergency response, preparedness, prevention, and mitigation assistance to natural and human-induced disasters around the globe, in support of the USAID's disaster assistance program.

Highlights of FY 1992 were:

- Participated in humanitarian assistance efforts to the former Soviet Union.
- Placed four people in key positions for the distribution of food relief to the famine-plagued population of Somalia.
- Headed up development of a hurricane simulation exercise in the Caribbean.
- Participated on the team to assess humanitarian needs for the Kurdish people of northern Iraq and Turkey.
- Provided training for trainers and developed course material for Latin American disaster responders.
- Finalized the Disaster Assistance Relief Team (DART) Manual and a guide to field operations for use by teams at disaster sites.

Tropical Forestry

Congressional interest in the Tropical Forestry Program, funded in the State and Private Forestry appropriation, continues to be high. Funding was doubled to \$4.9 million in FY 1992, and the funds were distributed worldwide through partnerships with 110 organizations. New guidelines and policies for the new operation have been established, and needed personnel adjustments have been made.

Highlights of FY 1992 include:

- Participated in a workshop on the management of rain and mangrove forests in the Federated States of Micronesia.
- Funding was provided for two full-time employees to work with the U.N. Food and Agriculture Organization (FAO) on its Forest Resource Assessment 1990 project.
- Entered into a new working partnership with the Peace Corps. Technical and financial support was provided to backstop the Peace Corps' Forest Conservation and Education program in 31 tropical countries.
- Co-sponsored, with the Tropical Forestry Foundation, a workshop on forest ecology in southeast Asia. Also, in conjunction with the U.N. Food and Agriculture Organization, trained people from 10 countries on the Asia Pacific Agroforestry Network.
- Worked with the Institute of Tropical Forestry in Puerto Rico to produce a photographic guide to the trees of the Tapajos National Forest in Brazil.
- Conducted, in collaboration with State and Private's Fire and Aviation Management staff, workshops in fire training and fire assessment in Brazil and Indonesia.

International Visitors

In FY 1992, the agency hosted over 350 international visitors, many at the ministerial level.



A Japanese delegation visiting the North Central Experiment Station. Photo by Jeff Sirmon

Scientific Exchange, Cooperative Research, and Bilateral Agreements

In FY 1992, enhanced science and technology exchange was achieved by working with the Office of International Cooperation and Development to bring about 15 technical visits and 11 cooperative research projects. The agency also participated on the Research Coordinating Council of International Research, securing co-financing for dozens of international science and technology exchanges and cooperative research activities. Science and technology transfer was also expanded through agreements with India, China, Russia, and Mexico. Bilateral agreements were signed with Brazil, Mexico, Venezuela, and Russia.

Cooperative Forestry

The Forest Service represented the United States in the U.N. Organization for Economic Cooperation and Development (OECD) meeting on revision of the Forest Import/Export Trade Scheme. The Forest Service is currently serving as part of an "expert group" working on revisions, and the agency also represented forest-based industrial development on the CARibbean COMMunity (CARICOM) Tropical Forestry Action Program mission team to the Dominican Republic.

Assistance was provided to the developing world by assisting the U.S. Agency for International Development with programmatic environmental assessment projects in Papua New Guinea, the Solomon Islands, and Vanuatu. Technical assistance was also provided to the German and Russian governments on the design of large-scale tree planting programs, and the Czechoslovakian government on the reforestation of areas damaged by air pollution.

International Fire Activities

The role of the Forest Service as a leader in international fire management grew in FY 1992. Fire management specialists assisted managers from many nations in a wide range of fire suppression, fire prevention, and prescribed fire projects. Major programs continue in Brazil, Mexico, and Indonesia. Other countries participating in exchanges included Israel, Chile, Jamaica, Spain, France, and Botswana.

Forest Pest Management

Training was provided in aerial and ground survey techniques, impact evaluation, and pesticide handling and application techniques to foresters in Kenya to control non-native aphids. A cooperative relationship was established with Russia to prevent the introduction of the Asian gypsy moth into North America by grain ships that had visited Russian ports.

Other Coordination Activities

Forest Service staff participated in a workshop in Pushchino, Russia, on the mapping of ecoregions, and also visited Israel and Czechoslovakia. Agency personnel participated in minerals symposia in Australia, Canada, Italy, and Spain. Forest Service minerals specialists also provided on-site technology transfer to Venezuela and Australia. Training in Venezuela has led to reduced adverse effects from gold and diamond mining on the headwaters of the Amazon River.



FS Photo

The Research Mission

The Forest Service has the most extensive integrated forestry research program in the world. The program is designed to enhance the environmental quality of America's 1.6 billion acres of forests and associated rangelands, while improving resource conservation, productivity, and protection, as well as increasing the overall effectiveness of forest management. The Research program is focused on serving society by developing and communicating the scientific information and technology needed to protect, manage, use, and sustain the natural resources of forest and rangelands for the benefit of a diverse public.

Using the direction of the 1990 RPA Program and the recently adopted Strategy For The 90's for Forest Service Research, the agency's scientists conducted or participated in more than 2,800 studies and published 2,673 scientific and technical papers in FY 1992. The Research program is based nationally at the Forest Products Laboratory in Madison, Wisconsin, and at eight regional experiment stations, each having several field facilities.

In FY 1992, appropriations for Forest Service Research totaled approximately \$181 million, of which \$30 million supported cooperative studies with colleges, universities, industry, and other domestic and international organizations (tables 54 through 56).

Forest Service Research is funded under five broad budget line items: forest protection, resource analysis, forest management, forest environment, and forest products and harvesting. Continuing long-term research is conducted in each of the budget line items, providing the foundation for the entire program. Much of the scientific knowledge methodically developed over time in the foundation portion of the program is often the only baseline information of its type in the world.

Forest Protection Research (FPR) develops improved methods for preventing, predicting, controlling, and reducing the effects of wildfires, insects and diseases. Basic knowledge is sought about forest/atmosphere interactions needed to monitor and predict global change effects on forests and pest dynamics caused by climate, air pollutants, and other changing atmospheric factors. The program emphasizes a broadening of the knowledge base of beneficial functions and uses of fire, insects, and micro-organisms needed to maintain healthy, productive forest and rangeland ecosystems.

Resource Analysis Research (RAR) provides a scientific basis for assessing the current condition and outlook for forest land resources, forest product investments, and markets — including evaluation of international trade. RAR also develops methods for improving management of outdoor recreation, wilderness, and urban forest resources.

The Forest Management Research (FMR) program is directed toward achieving higher levels of health, quality, and productivity from forest lands by developing environmentally, biologically, and economically sound forest management practices through science. Basic research is directed toward understanding the

physical, biological, and genetic factors that control the development of individual trees, forest stands, and natural ecosystems. Emphasis is placed, as well, on science that maintains and promotes biological diversity.

Forest Environment Research (FER) provides leadership for developing the knowledge, techniques, and strategies needed to manage, protect, or enhance forest, rangeland, and associated aquatic ecosystems. Emphasis is on sustaining ecological processes; biodiversity; and water, wildlife, and fish resources.

Forest Products and Harvesting Research (FPHR) provides the science and technology to harvest, produce, and use wood products in ways that are efficient, safe, and environmentally beneficial. Research has concentrated on obtaining the optimum yield from the harvested forest resource through environmentally acceptable processing systems and through an enhanced understanding of the resource.

In addition to the foundation program of research, special emphasis is placed each year on selected critical national and/or international problems. For FY 1992, the national problems were: global change, water quality, threatened and endangered species, declining forest-based economies in rural America, southern forest productivity, and catastrophic forest fires.

Research results are disseminated through symposia, workshops, direct contacts and numerous publications (table 57). Publications are frequently prepared on the same subject for both consumer use and scientific peer review.

Research accomplishments in FY 1992 demonstrate scientific support for the agency's new policy to implement an ecological approach to multiple-use management. Most of the accomplishments are displayed under the four themes of the 1990 RPA Program: (1) Enhanced Recreation, Wildlife, and Fisheries Resources, in which Research is directed to focus on how to enhance the compatibility of multiple resource uses on all lands; (2) Environmentally Acceptable Commodity Production, in which Research is directed to develop a better understanding of basic ecology and methods of management that reduce environmental impacts and improve resource inventory data; (3) Improved Scientific Knowledge About Natural Resources, in which Research is directed to increase the study of forest and rangeland ecosystems to expand the array of resource production opportunities and to protect the environmental integrity of the resource base; and (4) Response to Global Resource Issues, in which Research is directed to expand efforts to better understand global ecological interactions.

The accomplishments described below highlight the contribution of the FY 1992 Research program to the direction of the 1990 RPA Program. The research accomplishments reported here are, in most instances, the culmination of several years' work.

**Old-Growth Forests and the Western Spruce Budworm:
Co-Existence in the Southern Rockies**

The western spruce budworm is the most damaging insect pest in southwestern mixed-conifer forests. Cooperative research between the Rocky Mountain Station and the University of Arizona's Laboratory of Tree-Ring Research has concluded that climate plays a major role in triggering budworm outbreaks, with more budworm activity in wetter periods, contrary to the pattern in the Northwest. Outbreaks do not appear to originate in older stands; nor do they occur more or less frequently there. Most old trees survive repeated outbreaks. The policy of fire exclusion has contributed to the increased extent, severity, and synchronicity of recent outbreaks by favoring multistoried stands of shade-tolerant species preferred by the budworm.

An Old-Growth Forest Is More Than Old Trees

Our society loves old trees! However, our concepts of what constitutes old-growth forests and how to perpetuate them are unclear. Different forest types develop very different old-growth characteristics — some are open and parklike, while others are characterized by decadent trees, snags, and rotting logs. In some cases, a forest may maintain old-growth characteristics almost indefinitely. Most, however, eventually fall victim to a devastating fire, storm, disease, or insect outbreak. Foresters charged with managing old-growth forests in the Rocky Mountains and Southwest are benefiting from research at the Rocky Mountain Station on the processes that lead to old growth in forests of different species. Training sessions are being developed to help managers identify true old growth in the major forest types, and recognize younger stands that should be protected to become the old-growth forests of the future.



Measuring to better understand old-growth forested ecosystems.
FS Photo

Understanding the Role of Natural Fire

Fire plays a vital role in shaping the composition and structure of wildland vegetation. Recent research classified vegetation zones according to characteristic patterns of fire frequency, severity, and effects. This classification of "fire regimes" helps

managers identify ecosystems where conditions are unnatural and new management strategies are needed, and helps managers design prescribed fire and other treatments that will be consistent with natural processes.

**Managing Southwestern Forests for the
Northern Goshawk**

An interdisciplinary team has developed a comprehensive set of forest management guidelines to ensure the future of the northern goshawk. Application of the guidelines will be a step-wise process over the next several decades in the three major forest types where the goshawk is found in the Southwest. Because these guidelines are among the first to apply the concepts of an ecosystem management approach, they will likely serve as a template for the development of forest plans in the Southwest, but possibly throughout the West.

**Comparing Old-Growth and Managed Forest
Landscapes for Biodiversity**

How can forests be managed to conserve biological diversity? How does forest harvesting affect biological diversity? To answer these questions, North Central Station scientists used the Sylvania Wilderness located on the upper peninsula of Michigan to demonstrate how unmanaged landscapes differ from nearby managed landscapes and how these differences influence biodiversity. This research gives forest managers tangible information on how to retain complexities of old-growth landscapes in managed systems as well as how to enhance biological diversity. Results of this research are already being applied. For example, managers on the Huron-Manistee National Forest in Michigan are incorporating complexities of old-growth landscape features into a system of natural areas on the forest.

**The Economics of an Ecological Approach to
Multiple-Use Management**

Economics research results at the Southeastern Station and the University of Rhode Island indicate that thinking in terms of ecosystems and landscapes rather than stands of trees is going to yield different and more realistic economic decisions. Research is underway to develop satisfactory models that account for spatial arrangements of forest conditions across landscapes.

**Long-Term Research Supports Ecosystem
Management Concepts**

Much of the scientific information serving as the basis for an ecological approach to multiple-use management comes from long-term research on small, forested watersheds. Long-term data and information from the Hubbard Brook Experimental Forest in New Hampshire were used to prepare a book, titled "Ecology and Management of Northern Hardwood Forests in New England." A study in a central Maine watershed showed that atmospheric deposition has potential for causing more serious and long-lasting impacts on soil productivity than timber harvesting. Research has also demonstrated that low rates of sediment loss can be maintained during harvest operations by following Best Management Practice regulations and guidelines—many of which originated from research on the Hubbard Brook Experimental Forest.



Economic analysis at the landscape level rather than the stand level may result in different decisions FS Photo

Economic and Environmental Effects of Alternative Harvest Methods

A cooperative research effort was conducted between the Ouachita National Forest, the Southern Forest Experiment Station, and the University of Arkansas to assess the impact of harvest method on costs and residual site damage. Results of the study can be used to manage uneven-aged forest stands on the National Forest System to maintain productivity while minimizing environmental impacts.

RESEARCH TO ENHANCE RECREATION, WILDLIFE, AND FISHERIES RESOURCES

Demographic Studies of the California Spotted Owl in the Central Sierra Nevada

In 1990, scientists at the Forestry Sciences Laboratory in Fresno, California, initiated two demographic studies, one in the Sierra National Forest and one in Sequoia and Kings Canyon National Parks, to assess impacts of logging on spotted owls. Future results from this study will be used to help develop Forest Service resource management guidelines.

Aquatic Habitats and Resources of the Copper River Delta

The objective of this study was to bring together an interdisciplinary group of scientists to conduct a short-term, intensive study of aquatic ecosystems on the Delta. The study examined the physical factors and vegetative characteristics of aquatic habitats and populations. The results indicated that complex interactions occur among physical characteristics of the habitat affecting biological production. Managers are using these data to assure orderly development of the Delta's unique combination of privately and publicly owned resources.

Effects of Fine Sediment on Salmon and Trout Survival

Fisheries biologists and hydrologists at the Boise Forestry Sciences Laboratory are investigating the relationship of sediment to the survival of fish during the earliest stages of their life cycle. Knowledge of that relationship will help biologists and managers understand how much sediment is too much for fish survival and what conditions fish need. This knowledge is critically important because of the endangerment of the Snake River sockeye and chinook salmon. Intermountain Station scientists, in cooperation with the Agricultural Research Service, developed the "Salmonid Spawning Analysis" computer model that links other computer models created by the Corps of Engineers and the U.S. Fish and Wildlife Service. It provides a more complete analysis of environmental factors in the redds where eggs develop into fish. This analysis will help managers preserve critical habitats for the sockeye, chinook, and other endangered salmonids.

Ethnic Differences in Recreation Preferences for National Forest Sites

The purpose of this study was to explore differences among Hispanics and Anglos in the kinds of facilities and services they desire at forest recreation sites. Managers are using the study results to improve recreation site management. Some managers have added signs and are making plans to renovate sites to help meet the desires of Hispanic visitors.

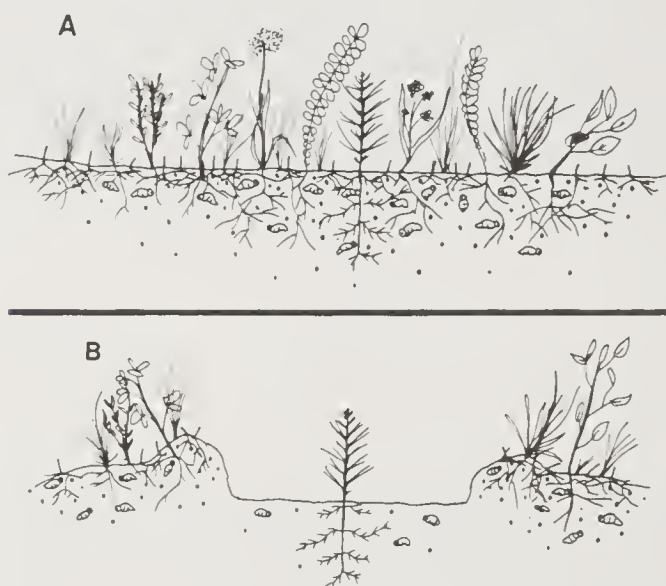
Measuring the Benefits of Leisure: Why Walk in the Woods?

How do forest managers identify and measure the benefits people derive from activities in the woods? Innovative research focused at the Rocky Mountain Station has resulted in a book, "Benefits of Leisure," that includes chapters by "leisure scientists" from around the world. A second product of this research was a workshop that resulted in the concept of Benefits-Based Management of Public Amenity Resources.

RESEARCH TO PROVIDE FOR ENVIRONMENTALLY ACCEPTABLE COMMODITY PRODUCTION

Pest Management in Conservation Reserve Plantings

In a cooperative study by the Florida Division of Forestry, the Southeastern Station, and the Integrated Forest Pest Management Cooperative at the University of Florida, several methods of preparing the sites for pine planting and several pest control chemicals were evaluated. The application of these results will help private, nonindustrial landowners as well as timber companies convert former agricultural lands to productive pine forests.



Top sketch: *Fungus propagules of whitefringed beetles attack newly planted seedlings.* Bottom sketch: *Scalping away a few inches of soil moves most of the pests away, and the seedlings can thrive.*

Barnard, et al., *Scalping...Agricultural Croplands*

New Sex Pheromone for Manipulating Populations of Spruce Beetles

A new lure for trapping spruce beetles has been developed and successfully tested in Alaska and western Canada. The new lure will be used by natural resource managers to monitor and reduce populations of spruce beetles.

Development of an Expert System for Spruce Beetle in Alaska

A computer-based knowledge-base system (SBexpert) was developed for managing spruce beetle in Alaska. The system enables land managers in Alaska to diagnose the hazard and risk of spruce beetle outbreaks. It also provides management recommendations for reducing hazard and risk.

Smoke Management Information System

The Washington State Department of Natural Resources requested that the Fire and Environmental Research Application

group in Seattle create a computerized system to track emissions from prescribed burn reports. The system, called SMSINFO, uses data on fuel and weather conditions present at the time of the burn to estimate fuel consumption and emissions. Implemented on August 1, 1992, SMSINFO is used by the State to track biomass consumption, control daily emissions from prescribed burning, and assess burning fees.

Long-Term Research on Experimental Forests Paying New Dividends

A study initially established in 1957 by Forest Service scientist Dr. William Boyer to determine the effect of stand density on seed production provided conditions that have since supplied valuable information unrelated to the original study; information that would otherwise take years to obtain. One example is the long-term development of longleaf pine regeneration under a range of parent overstories. These observations highlight how investments made in long-term silvicultural research in the past can help address current management issues.

Forestry Intensified Research (FIR) Program for Southwestern Oregon

In 1978, the Forest Service, in cooperation with Oregon State University, initiated a major program of research to improve reforestation practices in interior southwestern Oregon. The work culminated in 1992 with the publication of a 500-page book, "Reforestation Practices in Southwestern Oregon and Northern California," which synthesized existing knowledge and summarized the research results from the program.

Basin Scale Impacts of Land Use on Salmon and Trout Communities

How timber harvest and related activities affect salmon and trout communities across broad areas of the landscape has been a long-term vexing question for land-use planners and resource managers. A large number of sensitive stocks are potential candidates for listing as threatened or endangered species. The objective of this research was to develop guides for integrating timber and fish habitat management. Results show that habitat simplification is a key contributor to the decline of salmonid stocks and that as timber harvest proceeds in a basin, special efforts are needed to protect and maintain habitat diversity and complexity broadly across the landscape. Managers are using this information to achieve a balance between timber harvest and aquatic habitat complexity so fewer salmonid stocks will become sensitive, threatened, or endangered.

New England Wildlife: Management of Forested Habitats

Three Northeastern Station scientists and a National Forest System wildlife biologist have written a book outlining how to manage New England forest ecosystems to provide habitat for 338 different wildlife species as well as produce wood fiber. This guide, "New England Wildlife: Management of Forested Habitats," is the second of a two-volume set. The first volume, "New England Wildlife: Habitat, Natural History, and Distribution," provided detailed information on 338 species of forest wildlife. For the first time, land managers have at their fingertips a comprehensive summary of management procedures describing alternative ways to manage vegetation to meet landowner objectives for wildlife and timber.

Forest Health Monitoring in the Western United States

Jointly developed by the Forest Service and the Environmental Protection Agency, forest health monitoring is conducted in partnership with the National Association of State Foresters, the Soil Conservation Service, and the Bureau of Land Management. During FY 1992, the Intermountain Station's inventory unit implemented the cooperative monitoring effort with the installation of 48 "sentinel plots" and studied the plots to learn about human-related impacts, such as acid rain on western forests.



Forest health monitoring crews collect a wide variety of data, including lichens. Laboratory analysis can reveal the kind of air pollution in the forest ecosystem where the data is collected.

FS Photo

RESEARCH TO PROVIDE FOR IMPROVED SCIENTIFIC KNOWLEDGE ABOUT NATURAL RESOURCES

Effects of Water Deficit on Carbon Balance and Defense of Loblolly Pine Against the Southern Pine Beetle

Research has verified the hypothesis that moderate water deficits enhance tree resistance to bark beetle attack, whereas abundant water supply reduces tree resistance, although growth is enhanced. These results have greatly improved the understanding of tree resistance to beetle attack and imply that host-tree conditions are important factors in beetle population fluctuations.

Dogwood Anthracnose Infection Patterns in North Carolina Mountains

Since dogwood anthracnose was discovered in the Southeastern United States in the late 1980's, it has been found in seven States there. Losses in some areas have been very heavy. A study on 65 plots in the Nantahala Mountains of western North Carolina has yielded some valuable results. Participating scientists from the University of Florida and the Southeastern Station found test conditions favorable to dogwood (greater density, higher sunlight, and southwest slopes) do not favor the disease.

Research Responds to Asian Gypsy Moth Threat

Scientists at the Northeastern Forest Experiment Station responded quickly to the discovery of the Asian gypsy moth in 1991 in Washington, Oregon, and British Columbia. Working through a university cooperator, a diagnostic tool was developed using DNA technology to identify Asian gypsy moths that were caught in detection traps. Prior to initiation of aerial spray programs to eradicate this pest, scientists from the Northeastern Station and APHIS jointly conducted bioassays to determine the susceptibility of Asian gypsy moth larvae to a commercial formulation of the microbial pesticide *Bacillus thuringiensis* (Bt). A 22-minute video was produced and distributed nationwide to inform the general public and affected governments about the Asian gypsy moth.

Cuticular Hydrocarbons as Chemical Fingerprints

A new effective method for identifying forest insects has been developed. The procedure chemically analyzes insect cuticles to identify hydrocarbons, which are unique to each insect group. Joint genetic/hydrocarbon studies have validated the reliability of hydrocarbons in separating sibling species, subspecies, and geographical races. These preliminary results indicate this technology shows potential for distinguishing Asian gypsy moths from European moths that may arrive in American seaports.

A Greenhouse Under the Snow?

Carbon dioxide and methane are important "greenhouse" gases. Although the sources of many of these gases are known, the balance between production and consumption on a global scale is not well understood. Rocky Mountain Station scientists have discovered, however, that carbon dioxide is produced and methane is consumed in soils under alpine and subalpine snowpacks and even in the snowpacks themselves. Since the microbiology of the snowpack is much simpler than that of the soil, the snowpack will provide a simplified system to help scientists understand the processes involved in the production and consumption of carbon dioxide and methane—and perhaps other greenhouse gases—in other ecosystems.

Ecology and Decline of Red Spruce in the Eastern United States

Research to understand how air pollution affects forest declines was undertaken by the Spruce-Fir Research Cooperative of the National Acid Precipitation Assessment Program. This work, managed jointly by the Forest Service and the Environmental Protection Agency, has been completed. The results are being used to guide development of national air pollution control policies and to improve the management of red spruce stands.

A Genetic Linkage Map for Loblolly Pine Based on Restriction Fragment Length Polymorphisms (RFLP's)

A genetic linkage map for loblolly pine has been constructed based on DNA markers called restriction fragment length polymorphisms (RFLP's). The map is a first step towards identifying the genes which control various aspects of growth and development of this important forest tree species.

Enhancing Species Diversity in Northern Hardwoods Management

North Central Station scientists studied 40 years of research data from managed northern hardwoods on the Argonne Experimental Forest in northern Wisconsin to compare the tradeoffs between biological diversity and profit. Scientists found that some silvicultural methods are more effective than others for increasing both species diversity and economic returns. Results of this research can help managers understand the tradeoffs in economic efficiency and biological diversity of their forest management actions. The study and results were described in an article in the September 1992 issue of the "Canadian Journal of Forest Research."



Large sugar maple trees are more likely to result from a selection harvest, rather than shelterwood cutting. FS Photo

Investigating the Compatibility of Horses and Hikers

Growing numbers of complaints from hikers about sharing wilderness with horses are stimulating concern about the conflict between hikers and horse users in national forest wildlands. Researchers of the Intermountain Station surveyed hikers and horse users in California where the conflict was known to exist. The survey showed that hikers place a higher value on solitude than do horse users but actually experience less solitude because they have more encounters with other people than do horse users in wilderness.

Urban Forests Save Energy and Reduce Carbon Emissions

Computer programs were developed by Northeastern Station scientists to model energy conservation and carbon sequestration of individual trees and urban forests. The models were tested against field data collected in Oakland, California—the first comprehensive urban forest structural analysis—and several other locations in cooperation with research partners. Expanding findings from these models to the national level suggests that planting 10 million urban trees annually over the next 10 years could directly sequester and offset, through energy conservation, 363 million metric tons of carbon over the next 50 years—1 percent of the estimated carbon emissions in the United States over the same time period. Two southern California utilities are using the study results to develop energy efficient landscape design incentives for new residential construction and retrofits and to create landscape design guidelines for customers, landscaping professionals, and contractors.

Development of a Forest Cover Type Map From AVHRR Data: A Support Project for the 1993 RPA Update.

Research at the Southern Station's Forest Inventory and Analysis Unit have used Advanced Very High Resolution Radiometer (AVHRR) digital data from polar-orbiting satellites to develop a national forest cover map of the United States. The final map will be included in the next Resources Planning Act (RPA) assessment update. Southern Station scientists are currently working in a cooperative effort to produce a similar national forest cover map of Mexico.

Machine Vision Systems To Grade and Process Hardwood Lumber

United States hardwood producers need machine vision and automated processing systems to reduce costs, increase the volume and value of lumber recovery, and more accurately grade and describe products. Several promising systems are being developed cooperatively by Virginia Polytechnic Institute and State University and the Southeastern Station at Blacksburg, Virginia. Research is continuing to improve defect recognition and to prepare machine vision systems for use in hardwood sawmills.

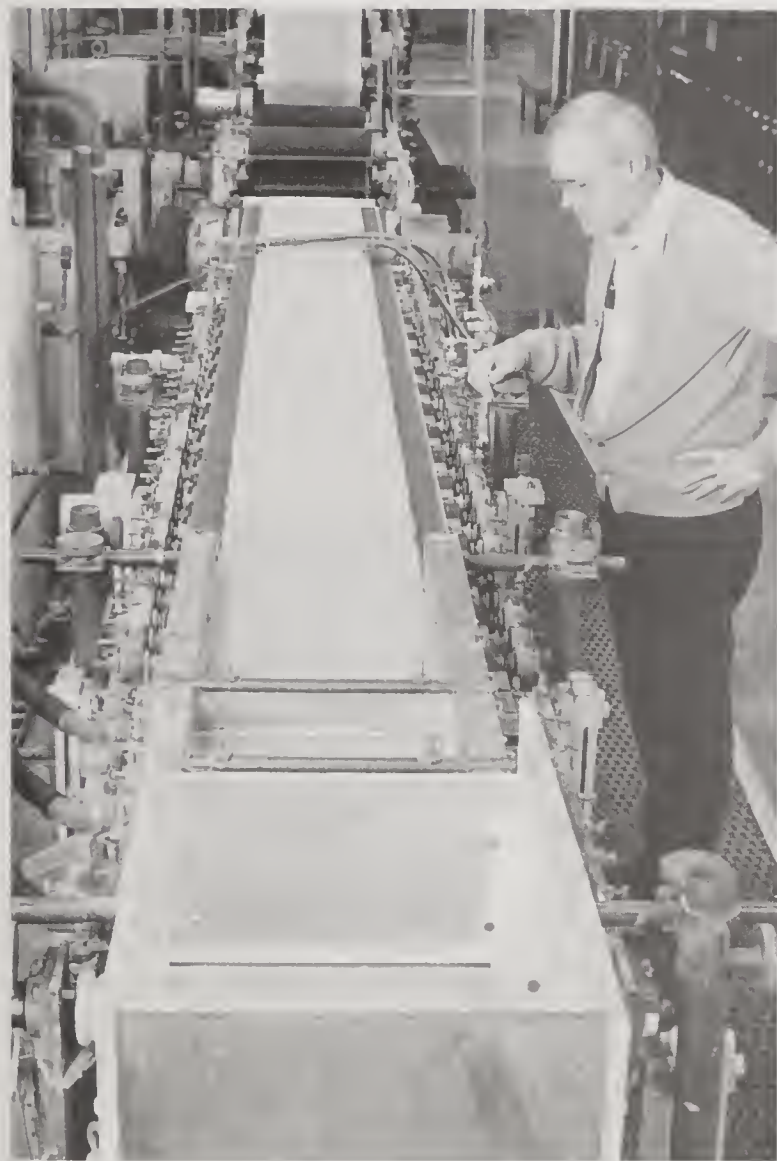
Developing Molded Structural Products from Recycled Fibers

Researchers at the Forest Products Laboratory have developed and patented a technology called "Spaceboard" that can use recycled fiber from almost any source with only minimal screening. The "Spaceboard" technology can be used to form a wide variety of products, ranging from packaging materials and furniture corestock to building panels and aerospace materials. Two companies have licensed this technology for their exclusive use in their firms' existing product areas.

Extending Timber Resources Through Kenaf Pulping and Papermaking

Finding alternative sources of fiber is one method of extending the Nation's timber supply. Kenaf, an annual, nonwoody plant from east-central Africa, was first studied in the United States in the 1940's as an alternative source for cordage. The Forest Products Laboratory, in cooperation with the Agricultural Research Service and the Cooperative State Research Service, initiated an investigation into the use of kenaf for newsprint,

linerboard, and lightweight printing papers. Based on the results of this research, a private company is seeking financing for a Texas newsprint mill that will use kenaf and recycled newspapers.



Research demonstrated that Kenaf pulp blended with recycled newsprint can be used in a conventional papermaking machine to produce commercial newsprint. FS Photo

Structure Ignition Assessment Model

Many American cities are expanding rapidly into the surrounding countryside, where houses are built at the edges of forests. Forest fires, which are inevitable in some forest ecosystems, threaten these structures. A team of Forest Service scientists from the Southern Forest Fire Laboratory in Georgia, the Riverside Fire Laboratory in California, and the Forest Products Laboratory in Wisconsin have developed a model for predicting the probability of structure ignition. Testing of the ignition model prototype by the Forest Service and the California Department of Forestry and Fire Protection will occur in the spring of 1993.

Building Code Basics Provided from Research

Architects and engineers depend on building codes to guide them in the design and construction of safe, reliable buildings. The national standards used for wood construction were recently revised based on research by Forest Products Laboratory engineers. The recently published "National Design Specifications (NDS) for Wood Construction" represents a major revision of U.S. engineering standards. The latest revision

introduces the first design formulas ever established for some types of connections and beam-columns, innovations taken directly from research at the Forest Products Laboratory. In addition, the development of a new type of design system for wood construction, termed Load Resistance Factor Design, puts wood on an equivalent design basis with concrete and steel, materials that have had similar standards for many years.

RESEARCH RESPONSE TO GLOBAL RESOURCE ISSUES

Understanding How Trees Respond Genetically to Attack From Insects and Disease

Scientists at the North Central Station are working with tree genes to develop special methods to counter forest tree pests and increase tree productivity in an ecologically sound way. In cooperation with researchers at the University of Washington, station scientists demonstrated that poplars and eastern white pine produce special enzymes called chitinases. Scientists are using specially engineered poplars to understand how activities of chitinase genes are controlled when trees are exposed to different stresses.



Inducing poplar to pull defense genes into action against leaf wounds. These genes normally fight invasion by insects and disease. FS Photo

Research Reveals Plant Communities Adapted to Past Climate Change

By studying plant fossils in woodrat middens, Intermountain Station scientists discovered that Great Basin plant communities have been dynamic and adapted to climate change for over 30,000 years. This fossil-based ecological history suggests to managers that Great Basin vegetation is better able to adapt to change than was assumed.

Pinning Down the Smoke-Filled Future with Monthly Fire Weather Forecasts

Recently, Pacific Southwest Research Station meteorologists at the Riverside Fire Laboratory and their cooperators developed computer models to forecast fire weather patterns a month in advance across the continental United States and Alaska. A computerized decision aid that integrates forecasts and forecast reliability information was also developed. The meteorologists showed that even marginally skillful forecasts can lead to cost-saving decisions.

Carbon Storage in Upland Forests of the Lake States

Researchers at the North Central Station and the University of Minnesota conducted a study to estimate total carbon storage in Lake States forests, including carbon in the trees, the forest floor, and mineral soil. Scientists found no strong geographic trends in carbon storage across the study area. However, total carbon storage was related to a variety of factors including forest type, stand age, available water, actual evapotranspira-

tion, and soil clay content, explaining about 65 percent of the variation. Understanding where and how carbon is stored can help managers determine how forest management decisions affect global climate change.

Tropical Forests Spur Development of Mixed Species Kiln Drying Method

Processing logs from a diversity of tree species in tropical forests is a challenge, especially in the critical steps of lumber drying. Researchers at the Forest Products Laboratory, working with several visiting scientists from tropical countries, developed a statistical method for quickly estimating the drying characteristics of wood. The results permit lumber processors to group species with similar drying characteristics. A cooperative research project to field-test the method is being developed with the University of the Andes in Venezuela. Knowledge gained about processing tropical species helps prevent tropical deforestation and increases economic incentives for landowners to practice sustainable forestry.



Researchers developed a method of grouping tropical species for better kiln drying results when diverse species are processed as lumber.
FS Photo

ADMINISTRATION

CIVIL RIGHTS

The Civil Rights program objective is to ensure fairness in all Forest Service activities, such as contracting, public access, grants, education, employment, public service, data collection, and employee rights. In carrying out these responsibilities, the concepts of multiculturalism are in the forefront.

The elimination of discrimination in employment and program delivery for all persons regardless of race, sex, color, national origin, marital status, age and handicap is a primary objective for the Civil Rights Staff.

Affirmative Employment Programs and program delivery ensure an equitable quality program that will complement and support the long-term goals of the Forest Service as the agency strives to become a multicultural organization.

Historically Black Colleges and Universities

The Historically Black Colleges and Universities (HBCU) Program is strengthening relationships with the 1890 Land-Grant Colleges and Universities, such as Tuskegee, North Carolina A&T, Lincoln, Florida A&M, Southern, and Alabama A&M. The specific efforts include the USDA 1890 Task Force Initiative, USDA Summer Intern Program, Capacity Building Grant Program and the Black Colleges and Universities Comprehensive Program.



Signing a partnership with Lincoln University. FS Photo

Multicultural Diversity

The agency continues to move toward becoming a multicultural organization. Work is under way in several key areas, including outreach and recruitment, work environment, and training and development.

HUMAN RESOURCE PROGRAMS

Human resource programs provide job opportunities and training for youths, the unemployed, underemployed, economically disadvantaged, people with disabilities, and elderly, while carrying out high-priority conservation work. During FY 1992, these programs offered employment and skills training to 142,468 persons. For an investment of \$91.5 million, \$126.3 million in accomplishments was returned from all programs (table 61). The participants constructed campgrounds, trails, office buildings, warehouses, fences, and roads; planted trees; fought fires; improved timber stands; and provided clerical support.

Job Corps

Under an agreement with the Department of Labor and authorized through the Job Training Partnership Act, the Forest Service administers 18 Job Corps Civilian Conservation centers throughout the United States. The aim of the centers is to improve the enrollees' job qualifications for productive work through training in vocational skills, basic education, and social development. Presently, 13 centers are coeducational.

During the past year, the Job Corps program has experienced new emphasis and change. The Job Corps centers began to institute a more intensive social skills program that focuses on helping students retain jobs. Other new program emphases include a computer tracking system for the education program, a new program in parenting and intergroup relations, and intensified efforts in the alcohol and other drugs of abuse program. Vocational skills training contracts with the carpenters, cement masons, painters, operating engineers and brick masons unions were renegotiated. New urban forestry and natural resource programs were started at two centers. Planning for remodeling and upgrading of center dormitories was also started.



Job Corps centers provide a variety of vocational training opportunities, including construction and equipment operation. FS Photo

These new projects have not lessened traditional efforts or partnerships. Agreements for student training continue with residential construction enterprises. Job Corps fire suppression crews continued to win praise for their disciplined and effective performance. Emphasis remains on increasing female enrollment and making the remaining five centers coeducational over the next 2 years. Centers continue to devote resources to community service, including the assistance of the Jacobs Creek's Heavy Equipment Crew to Hurricane Andrew relief efforts in Florida.

Over 81 percent of the graduates of the 18 Forest Service Civilian Conservation centers were placed in jobs, entered college or returned to school, or joined the military. The centers trained over 9,000 students between the ages of 16 and 22, of which 1,490 were female. Their work accomplishments in areas like recreation, fish and wildlife management, range management, timber management, water and soil, facilities, and protection amounted to over \$23 million in value.

Senior Community Service Employment Program

The program provides part-time community service employment for low-income persons age 55 or older, together with training to upgrade present skills and introduce new skills. In FY 1992, 16 percent of the participants were placed in unsubsidized private or public positions. A total of 5,651 participants produced \$40.6 million worth of conservation work, or a \$1.57 return per dollar of Federal cost.

Over the Forest Service's 20-year history with the program, the agency has provided employment and training opportunities for over 60,000 older Americans. The enrollees have contributed over \$300 million in work accomplishments to the National Forest System.

Volunteers in the National Forests

The Volunteer program provides assistance in natural resource protection and management programs at nominal cost. The program offers individuals and sponsored groups/organizations the opportunity to donate their talents and services to help manage the Nation's natural resources.

The number of volunteers continues to grow as people realize how they can personally contribute to the management of the Nation's natural resources. During FY 1992, 108,977 volunteers assisted in the management of the National Forest System, 15 percent more than in FY 1991. They contributed 2,577 person-years of work valued at \$41.2 million. Volunteers participate in resource protection and management, cooperative forestry, and research. Typical positions include campground hosts, information specialists, fire lookouts, and recreation, wildlife, and fisheries assistants.

The Chief's Volunteer National Awards Program annually recognizes volunteers and employees nationally for their contributions. During National Volunteer Week, many volunteer service awards were presented to individuals, sponsors, and Forest Service employees and units.

The Touch America Project, a component of the Volunteer Program, provides greater opportunities for youths age 14-17 to gain work experience and environmental awareness while working on public lands. In FY 1992, private sector organizations sponsored 4,641 youths in the Touch America Project. Projects included maintaining and building trails and constructing recreation areas.

Youth Conservation Corps

The Corps provides 8 weeks of summer employment for randomly selected 15- through 18-year old youths from all strata of society. Youths earn and learn while performing conservation work such as trail improvement and maintenance, sign painting, campground maintenance, slash treatment, and livestock corrals construction on the National Forest System. The enrollees are paid from Forest Service funds. In FY 1992, the 1,185 enrollees performed work valued at \$1.32 for every dollar spent.



Youth Conservation Corps enrollees maintaining trails.

FS Photo

Hosted Programs

Hosted programs provide conservation training and work opportunities on the national forests or in conjunction with Federal programs. Programs are administered through agreements with State and county agencies, colleges, universities, American Indian tribes, and private and nonprofit organizations with multiple objectives, such as disabled rehabilitation and advocacy for the elderly, or at-risk youth. Most workers represent little or no direct cost to the Forest Service since funds are supplied by State health and welfare agencies, the Job Training Partnership Act, State block grants, vocational rehabilitation offices, college work study, and other means.

In FY 1992, the 16,777 participants contributed work to national forest programs valued at \$17.9 million. These programs provide a potential pool of multiculturally diverse employees who are gaining experience in Forest Service programs.

The Department of Justice, Federal Bureau of Prisons, and the Forest Service signed a national interagency agreement on June 13, 1991. This cooperative agreement allows minimum-security inmates to work on the National Forest System. Currently, programs are operating successfully on eight national forests.

Take Pride in America

The Forest Service is one of the Federal sponsors of the Take Pride in America campaign, a national public awareness effort to encourage careful stewardship of the Nation's outstanding natural and cultural resources. Through a national awards program, public service advertising, and other activities, this campaign seeks to instill a sense of ownership and responsibility for these resources which truly belong to all Americans.

Keep America Beautiful, Inc.

Keep America Beautiful, Inc., is a nonprofit, public education organization dedicated to improving waste handling practices in American communities. Keep America Beautiful's Public Land Stewardship program involves volunteers in cleaning and maintaining public lands and resources. Public Lands Day (Federal Lands Cleanup Day) is observed annually.



Planting trees as part of the Keep America Beautiful program.
FS Photo

INFORMATION MANAGEMENT: A FRAMEWORK FOR THE FUTURE

Sharing and managing information are critical to performing the Forest Service's business, and there is a need to organize information management around the way business is conducted. This requires the integration of current functional systems and the sharing of information across functional areas. This also subscribes to the notion that people who develop and manage information are stewards of the information, not owners.

The Forest Service information management framework currently being implemented includes a vision of a desired future information environment and the process by which the agency will migrate to that new environment. Embodied in the vision and concept of information management in the 1990's are a number of basic principles:

- Information management is an integral part of every Forest Service program.
- Information systems are designed to help meet business needs.

- Data are captured at their source as a natural course of conducting Forest Service business.
- Data are entered once and used often.
- A shared environment consists of integrable databases coordinated through modern data management technology.
- Widely used, commonly understood, and persistent data, information, and processes are standardized.
- Data are consistent to the extent that implementation at each level, and across units, is compatible and mutually supportive.
- A shared-data environment ensures that information is available to employees and processes as needed.
- Data and information are shared with external cooperators and the public.
- An information technology infrastructure exists to support the business of the Forest Service at all locations.

Major accomplishments in FY 1992 that improved information management and moved the agency closer to an integrated/shared information environment were:

- Publication of a strategic information management planning document (Information Management: A Framework for the Future), which included recommendations on all aspects of information resource management—information systems, business processes, organizational roles, and responsibilities—as well as linking an overall information strategy to other related issues such as forest plan monitoring and evaluation.
- Award of a contract to complete a 10-year telecommunications strategic plan. This plan will assure that telecommunications developments are kept in phase with implementation of the information management framework, emerging government open systems interconnectivity standards, increasing employee use of electronic mediums, and increasing public demands for information.
- Identification of a joint process with the U.S. Geological Survey whereby information gathered by each agency for digitizing the Nation's primary base series maps will contribute toward the National Digital Cartographic Database. This effort will result in the development of one source of public land survey information that will be available for multiagency use.
- Increased use of information center services has significantly reduced the amount of time and money required for mailing, handling, and storing large classes of widely used information. Currently, 15 national information center services are available, as well as numerous information center services that provide local information. The fire effects information center is one example of a national information center.

In support of former President Bush's regulatory moratorium and review announced in the 1992 State of the Union Address, a major review of agency regulations was completed to identify opportunities to foster economic growth and reduce Government costs. Review teams conducted intensive reviews of several rules, resulting in proposals to streamline both special uses authorization processes and administrative appeals procedures. National Environmental Policy Act compliance procedures were streamlined in September 1992, with expected benefits of reduced costs in National Environmental Policy Act compliance while ensuring full disclosure of the environmental effects of agency projects. The revision of land and resource management planning regulations continued in FY 1992, with the expected outcome being better direction for revising forest plans and responses to the critique of the planning process conducted in 1990 and 1991.

Another accomplishment involving information management, outside the primary areas associated with information management framework was the resolution of the consent decree between the Forest Service and plaintiffs in the case of *Bernardi, et al. v. Madigan* (C-73-1110-SC). A wide range of work including fiscal reviews, accounting, directives analysis and issuance, and database design and implementation resulted in the court's lifting its supervision and closing this case.

PERSONNEL MANAGEMENT

USDA Demonstration Project

The Forest Service demonstration project experimental hiring authority is in its third year. Under this authority, in FY 1992, the Forest Service hired approximately 1,700 new employees. This hiring authority has led to a marked improvement in local recruitment efforts as well as in community relations.

Work Force Diversity

Haskell Indian Junior College—The national staffing and recruitment initiative at Haskell Indian Junior College continues to make the Forest Service "the employer of choice" at this intertribal college. The Haskell student body represents over 120 tribes. Of the 90 Haskell students employed in natural resource positions in FY 1992, 55 were employed by the Forest Service. More than 100 of the 800 students at Haskell are enrolled in natural resource courses, and many hope to work with Forest Service or with their tribal natural resource programs upon completion of their degrees. The natural resource program at Haskell Indian Junior College is the fastest growing program at the college, and the Forest Service is proud to support this program through employment and liaison activities.

Alabama A&M University—Based on two prior successful cooperative education pilot programs, the Southeastern Forest Experiment Station implemented the new and expanded cooperative education program with Alabama A&M University, in September 1991. The program is cooperatively sponsored by the U.S. Department of Agriculture, Southeastern and Southern Forest Service Experiment Stations, and the Southern

Region of the Forest Service. Fifty students receive financial assistance, either directly or through cooperative education assignments, and will be eligible for appointment to permanent positions with the Forest Service when they complete their educational commitments. Other components of the agreement include: a program manager/liaison position located on campus; 15 apprentices in the 1992 USDA Scientific Research Summer Program; 11 freshmen financial assistance awards; 11 upperclassmen majoring in forestry and related sciences; 10 Job Corps enrollees admitted to the Alabama A&M University School of Forestry; 3 masters level students enrolled in scientific research disciplines; and 25 students enrolled in Phase II of the agreement. Two students have become successful permanent employees of the Forest Service.

Disability Program

The Forest Service continues to work toward creating a diversified work force that includes persons with disabilities. During FY 1992, the Forest Service increased its representation of individuals with targeted disabilities from 0.89 percent in 1991 to 1.16 percent for FY 1992, exceeding the government-wide employment average of 1.14 percent for this group. The overall rate of employment of all people with disabilities increased from 4.45 to 8.05 percent for the same reporting period. The Forest Service was named co-recipient of the 1992 Secretary of Agriculture award for hiring persons with disabilities, including 30 percent or more disabled veterans.

The Forest Service has worked hard to meet the needs of its customers with disabilities. Accomplishments in making facilities more accessible are noteworthy in that many outdoor recreation facilities have been made accessible to people with disabilities. Some examples include accessible fishing platforms for people in wheelchairs, parking areas designated for the disabled, campsites with accessible facilities for the disabled, trail access for wheelchairs, and pier and boat dock access.

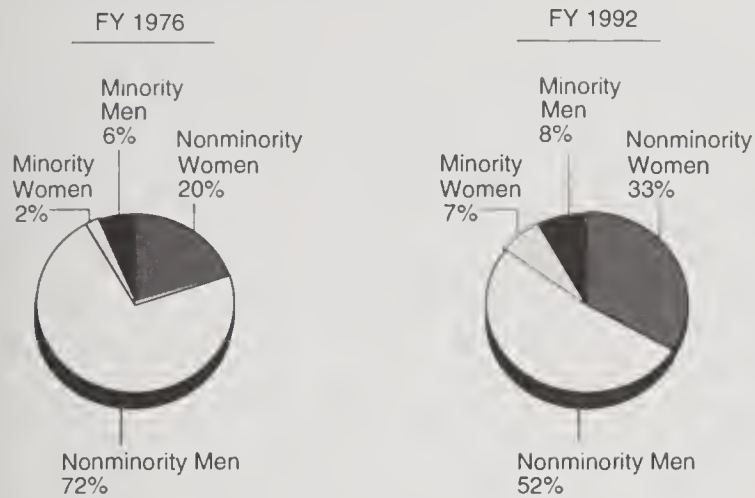
Total Quality Management

During FY 1992, the Forest Service focused on integrating the principles of "quality management" and "customer service" into its core policies and strategies. Both the new Mission/Vision statement and the ecosystem management approach were designed with a new "customer service" orientation. To facilitate the application of the "quality/customer" focus in future Forest Service policy making, a "Principle-Centered Leadership Guide" has been developed to help frame emerging issues and decisions.

Managing the Human Resource

Agency Work Force—The agency's permanent work force increased by 564 over the past year to 35,425. Wildlife and recreation were the primary growth areas. When compared to past years, the composition of the work force has changed significantly. Figure 45 displays some of the change in broad categories of the work force from 1976 to 1992. Table 58 displays the number of paid employees by occupational category for selected fiscal years and table 59 displays the number of paid employees by type of appointment for selected fiscal years.

Figure 45.
Change in Forest Service Work Force Composition

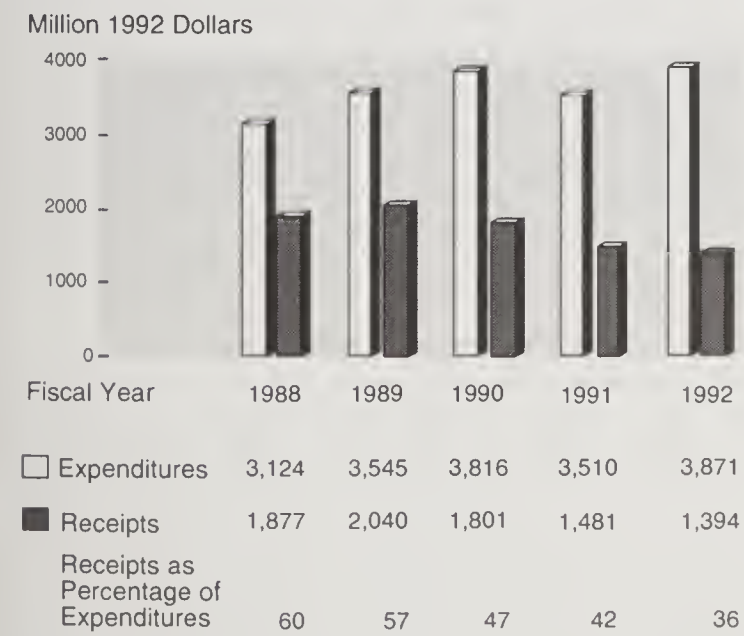


Data sources: 1976 Gain/Loss Report
1992 NFC DN-714 9/19/92

RECEIPTS AND EXPENDITURES

Although the Forest Service receives funds from Congress and other sources, it also produces revenue. In FY 1992, the Forest Service produced 36 cents of revenue for every dollar expended. Total receipts were \$1.39 billion, and total expenditures were \$3.87 billion (figure 46, table 62). Receipts were collected primarily from timber sales, mineral leases and permits, grazing fees, and recreation uses. Figure 47 displays the distribution of receipts by program area. Table 67 displays a summary statement of resource values and obligations, with a net benefit of \$9 billion (estimated to date).

Figure 46.
Forest Service Expenditures and Receipts

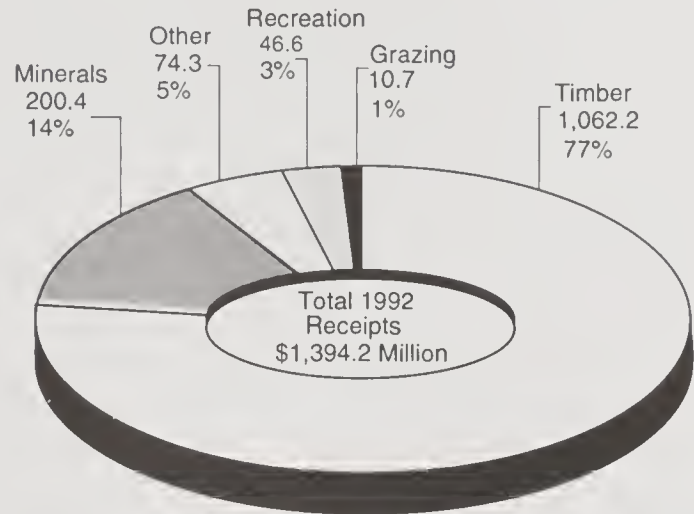


PROCUREMENT AND PROPERTY

FY 1992 was a very challenging and progressive year for the Procurement and Property Staff. Over \$500 million was spent in support of the Forest Service mission on new contracts and small purchase procurements. Eighty-two percent of the total

Figure 47.
Forest Service Receipts by Program

Million Dollars



procurement dollars went to small businesses. Contract awards included more than \$31 million to disadvantaged businesses and \$24 million to female-owned firms. Outreach programs continued to discuss procurement opportunities through exhibits at national minority conferences.

The use of the small purchase credit card has been fully implemented, with 2,400 cards now in use agency-wide. Over \$13 million worth of goods and services has been successfully procured using the system, with satisfactory results for all parties involved.

Forest Service personnel managed approximately 26 million square feet of administrative use space, with an annual rental of \$52 million, including buildings owned and leased by the agency and space controlled by the General Services Administration. Personal property worth more than \$1.9 billion (about 65 percent of USDA personal property) was acquired, used, and disposed of, including property on loan to State forestry departments. Approximately 4,000 units, with a value of \$40 million, were managed as living quarters for Forest Service employees.

The agency encourages the recycling of all materials to conserve resources and reduce the use of landfill space. Pursuant to Executive Order 12780, the Forest Service was the first USDA agency to appoint a program manager to coordinate waste reduction/recycling activities and to establish a network of local recycling coordinators at every field office location. This network oversees the implementation of waste reduction procedures, expanded recyclable collection activity (paper, glass, cans, plastics, etc.), and procurement preference for goods and supplies having recovered material content. The Forest Service conducted an internal national recycling workshop for education and program administration purposes. Additionally, the agency computer system is used for the systematic sharing of information on recycling to facilitate program management.



Involving people in project planning. FS Photo

PUBLIC AFFAIRS

Keeping People Informed and Involved

In FY 1992, the Forest Service continued its emphasis on effective and meaningful involvement of the public in caring for the national forests and grasslands. This meant an increase in the quantity and quality of opportunities for people to participate with the Forest Service at all levels of the organization. It also meant increased attention to training of Forest Service people in communication skills.

Public Involvement

In FY 1992, the Forest Service continued its public involvement efforts with a major emphasis on improving public involvement programs agency-wide. In response to strong agency interest in improving public involvement efforts, a task force evaluated current public involvement efforts and designed a public involvement model to be used in the revision of forest plans and other programs and projects.

The national forests, research stations, and other units of the Forest Service have actively encouraged public participation. The following examples illustrate Forest Service efforts:

- The Targhee National Forest has been using a community of interest approach in the revision of its forest plan.
- For the first time, the Chequamegon National Forest and the Lac du Flambeau Band of the Lake Superior Chippewa Indian Nation met together in a friendship powwow on the Lac du Flambeau Reservation; over 1,500 people of

northern Wisconsin attended the powwow, improving the understanding of other cultures and the issues of fishing and treaty rights, and building positive relationships.

Improving Communication

Helping Forest Service employees improve communications internally and externally was part of the focus of the Public Affairs Staff this year. The staff taught and hosted sessions for employees in all Forest Service regions, focusing on how to determine what is the most effective medium for a message, how to develop communication strategy plans, and what methods work best in keeping the public informed. For example, the Eastern Region offered 14 different sessions on improving communications to almost 150 employees in a 2-week period. In addition, on many national forests and the Washington Office, the Public Affairs Staff offered sessions on delivering information effectively to the press, radio, and television.

USDA PRESIDENTIAL TASK FORCE ON LOS ANGELES RECOVERY

The Forest Service was one of the first agencies to develop programs to help Los Angeles recover from the April riot.

The Forest Service developed two programs in its efforts to aid in the recovery. Opportunity L.A. was designed to provide temporary, 90-day jobs to more than 560 people from the riot-impacted area. The Urban Greening Initiative was a \$2.75 million matching grants program implemented by the State and Private Forestry section of the Forest Service, to allow community groups the means to improve their neighborhoods.

Opportunity L.A.

The Angeles, San Bernardino, Cleveland, and Los Padres National Forests in southern California offered a variety of positions to citizens from the riot-impacted areas, including trail maintenance, watershed improvement, and facilities improvement. Two 20-person fire crews were also established.



Maintaining recreational facilities on the Angeles National Forest with Opportunity L.A. crews. Photo by Larry Rana

The program was open to people 18 years old and older. Recruitment notices in English, Spanish, Japanese, and Korean were distributed to community and other groups to specifically target areas impacted by the riots. Nearly 3,000 people applied for the 560 jobs.

People who applied for jobs came from a variety of cultural and ethnic backgrounds.

For example, from mid-September to mid-October alone, the following work was accomplished:

- 131 campgrounds/picnic areas were maintained
- 214 picnic tables were painted
- trash was removed from 1,323 acres of forest
- 64 miles of trail were maintained
- 7,000 feet of water system was installed or maintained
- 56 buildings were painted and maintained
- 25 acres of streambanks were stabilized
- 10 graffiti removal projects were completed
- 42 fish habitat piles were installed
- 52,476 feet of fencing was installed
- 225 fire rings were maintained

The Forest Service conducted a Job Fair and put forth a concentrated effort to help Opportunity L.A. employees find other jobs upon completion of the program.

Urban Greening Initiative

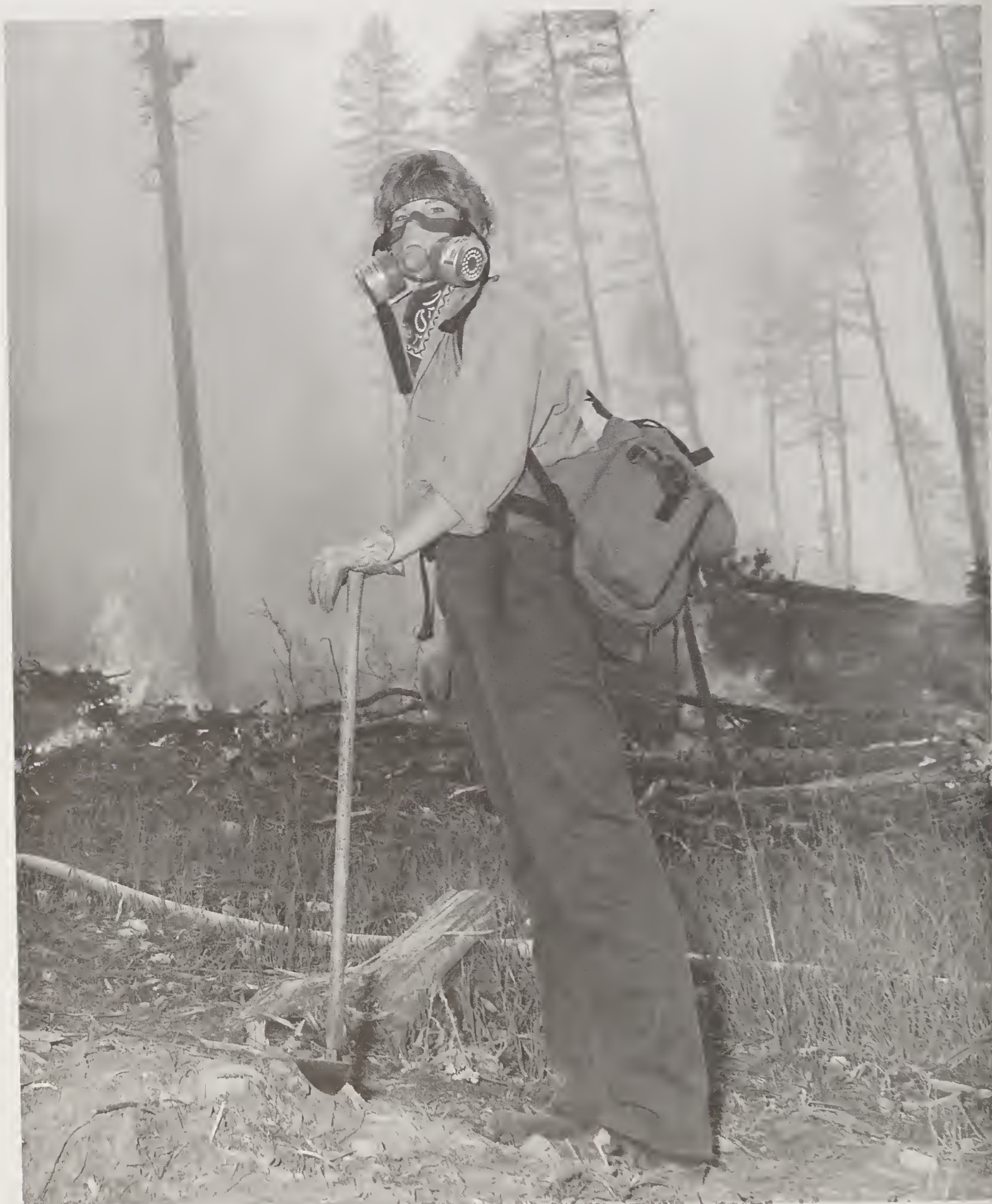
The second program in the USDA Presidential Task Force on Los Angeles Recovery was a \$2.75 million matching grants program to fund agroforestry projects in the riot-impacted and historically neglected areas of Los Angeles County.

The principal players involved in this initiative were the Forest Service State and Private Forestry section, University of California Cooperative Extension in L.A. County, and the California Department of Forestry.

The purpose of the grants was to fund planting or maintenance of trees, mini-orchards/gardens, urban landscaping, and community urban forest management projects. These projects provided entry-level employment in the nursery, landscape, and arboriculture industry.

Matching funds were required for all grants. A total of 86 proposals were submitted to the Urban Greening Initiative program, with 33 receiving grants. Grants were awarded to 29 nonprofit groups and four local governments. The grants range in amount from \$2,700 to \$250,000.

Three organizations—L.A. Conservation Corps, L.A. Harvest, and Tree People—each received \$250,000 in grants. These three serve as “umbrella” organizations and provide technical assistance to other grantees. Groups receiving grants have 18 months to complete their projects.



Research is underway to determine if respiratory fireline protection is necessary. FS Photo

1. Summary of National Forest System accomplishments compared to funded output levels and 5-year average--fiscal year 1992	92
2. National Forest System funding--fiscal year 1992 compared to long-term program costs	94
3. National Forest System funding--fiscal years 1988-92	96
4. Summary of National Forest System 1992 accomplishments compared to long-term program trends	98
5. Draft and final forest plan environmental impact statements filed with the Environmental Protection Agency by Region as of September 30, 1992	99
6. Lands administered by the Forest Service as of September 30, 1992	100
7. Miles of landline location by Region--fiscal year 1992	101
8. Land acquisition and exchange--fiscal year 1992	101
9. Wildlife and fish habitat inventory and improvement by Region--fiscal year 1992	102
10. Total recreation use on National Forest System lands by State--fiscal years 1988-92	103
11. State summary of total recreation use on National Forest System lands by activity--fiscal year 1992	104
12. Trail miles on the National Forest System by State--fiscal years 1990-92	106
13. Additions to the National Wild and Scenic Rivers System--fiscal year 1992	108
14. Acres of the National Wilderness Preservation System by State--calendar years 1988-92	109
15. Additions to the National Wilderness Preservation System--fiscal year 1992	110
16. Fuels treatment acreage accomplished by appropriation--fiscal year 1992	111
17. Pesticide use report--fiscal year 1992	112
18. Reforestation funding and accomplishments by funding source--fiscal years 1988-92	120
19. Reforestation program needs--fiscal years 1992-94	121
20. Reforestation needs as of October 1, 1992, by State, forest, and site productivity class	122
21. Reforestation and timber stand improvement acreages certified as satisfactorily stocked by State and National Forest--fiscal year 1992	128
22. Certification of reforestation and timber stand improvement acreages by Region--fiscal year 1992	136

23. Timber stand improvement funding and accomplishments by funding source-- fiscal years 1988-92	137
24. Timber stand improvement needs as of October 1, 1992, by State, forest, and cubic foot productivity class	138
25. Timber stand improvement program needs--fiscal years 1992-94	145
26. Timber offered, sold, unsold, and harvested--fiscal years 1988-92	146
27. Timber offered, sold, unsold, and harvested by Region-- fiscal years 1991-92	147
28. Timber sold and harvested by State--fiscal year 1992	148
29. Number of sales, volume, and value of timber sold on National Forest lands by size class--fiscal years 1988-92	149
30. Uncut timber volume under contract by Region--fiscal years 1988-92	150
31. Timber sale funding--fiscal years 1990-92	151
32. Statement of timber sale revenues and expenses--fiscal year 1992	152
33. Timber sale program—employment, income, and program level account-- fiscal year 1992	153
34. Timber sale program—the economic account--fiscal year 1992	154
35. Status of NFS acres within grazing allotments with range vegetation management objectives--fiscal year 1992	156
36. Range allotment management status--fiscal year 1992	158
37. Actual grazing use in AUM's by State--fiscal year 1992	159
38. Annual grazing statistics--fiscal year 1992	160
39. Planned and accomplished minerals cases by Region-- fiscal year 1992	161
40. Energy mineral workload and production--fiscal years 1988-92	161
41. Road and bridge construction and reconstruction by State-- fiscal year 1992	162
42. Purchaser election roads constructed by the Forest Service by State-- fiscal year 1992	165
43. Road maintenance accomplishments by State--fiscal year 1992	166
STATE AND PRIVATE FORESTRY	
44. State and Private Forestry funding--fiscal year 1992 compared to long-term program costs	168
45. State and Private Forestry funding--fiscal years 1988-92	169
46. Summary of State and Private Forestry 1992 accomplishments compared to long-term program levels	170

47. Summary of forest stewardship program accomplishments by State-- fiscal years 1991-1992	172
48. Summary of selected cooperative forest management and processing program activities--selected fiscal years	174
49. Summary of selected cooperative forest management and processing activities by Region--fiscal year 1992	176
50. Summary of selected cooperative forest management and processing activities by State--fiscal year 1992	178
51. Small watershed protection accomplishments--fiscal years 1988-92 (Watershed Protection and Flood Prevention Act of 1954)	180
52. Flood prevention accomplishments--fiscal years 1988-92 (Watershed Protection and Flood Prevention Act of 1954)	180
53. Wildfires on State and private lands protected under the Cooperative Forestry Assistance Act (P.L. 95-313)--calendar year 1991	181

FOREST RESEARCH

54. Forest Research funding--fiscal year 1992 compared to long-term program trends	182
55. Forest Research funding--fiscal years 1988-92	183
56. Extramural research funded through the Forest Service research appropriations--fiscal years 1991-92	184
57. Research publications by major subject area--fiscal years 1989-92	186

ADMINISTRATION

58. Number of paid employees by occupational category for selected fiscal years, as of September 30, 1992	188
59. Number of paid employees by type of appointment for selected fiscal years, as of September 30, 1992	188
60. Number and percent of all permanent and excepted-conditional employees by race/national origin and gender, as of September 30, 1992	189
61. Summary of Forest Service Human Resource Programs-- fiscal year 1992	190
62. Summary statement of receipts and obligations-- fiscal years 1991-92	192
63. Statement of receipts--fiscal years 1988-92	194
64. Statement of receipts--fiscal year 1992	196
65. Statement of obligations--fiscal year 1992	198
66. Statement of obligations--fiscal years 1988-92	200
67. Summary statement of values and obligations--fiscal year 1992	201

Table 1—Summary of National Forest System accomplishments compared to funded output levels and 5-year average--fiscal year 1992

Resource area	Activity	Units 1/	1992		Percent of funded	1988-1992 average accomplishment	1992 as percent of 5-year average
			Funded	Accomplished 2/			
Resource Recreation Wilderness Wildlife & fish	Visitor use	MM RVD's	290.0	287.7	99	265	109
	Management	MM acres	34.0	34.0	100	33	103
	Habitat improvement						
	Appropriated funds	M acres	265.5	242.8	91	201 3/	121 3/
	K-V funds 4/	M acres	-	236.9	N/A	214 3/	111 3/
	Habitat improvement						
Range	Appropriated funds	Structures	24,870.0	19,936.0	80 3/	18,805 3/	106 3/
	K-V funds	Structures	-	17,276.0	N/A 3/	21,091 3/	82 3/
	Habitat inventory						
	Appropriated funds	M acres	11,935.3	13,115.5	110	11,162 5/	118 5/
	K-V funds	M acres	-	33.0	N/A	86 5/	38 5/
	Forage improvement						
Timber	Appropriated funds	M acres	78.0	73.1	94	71	103
	K-V funds	M acres	-	30.0	N/A	28	107
	Forage improvement						
	Appropriated funds	Structures	1,781.0	2,662.3	149	2,690	99
	K-V funds	Structures	-	468.3	N/A	456	103
	Sales offering	B bd. ft.	8.3	5.1	61	9	57
Soil & water	Silvicultural exams	MM acres	6.4	4.8	75	5	96
	Reforestation 6/						
	Appropriated funds	M acres	123.0	162.6	132	151	108
	K-V funds	M acres	326.5	319.4	98	329	97
	Timber stand improvement						
	Appropriated funds	M acres	133.0	171.7	129	199	86
Minerals	K-V funds	M acres	187.0	181.4	97	160	113
	Resource improvements						
	Appropriated funds	M acres	23.1	26.4	114	25	106
	K-V funds	M acres	-	9.1	N/A	5	182
	Soil inventory	M acres	6,441.0	6,464.0	100	8,578	75
	Leases and permits	Cases	25,487.0	26,531.0	104	26,578	100

See footnotes at end of table.

Table 1—Summary of National Forest System accomplishments compared to funded output levels and 5-year average--fiscal year 1992--
Continued

Resource area	Activity	Units 1/	1992			1988-1992 average accomplishment	1992 as percent of 5-year average
			Funded	Accomplished 2/	Percent of funded		
Support	Trail construction/reconstruction	Miles	1,432.4	1,975.6	138	1,818	109
	Road construction						
	Appropriated funds						
	Construction 7/	Miles	144.0	100.7	70	163	62
	Reconstruction 7/	Miles	688.0	752.5	109	813	93
	Purchaser credit						
	Construction 8/	Miles	1,593.0	1,080.2	68	1,550	70
	Reconstruction 8/	Miles	3,145.0	2,506.5	80	3,167	79
	Fuel management						
	Appropriated funds	M acres	277.5	285.0	103	311	92
	Brush disposal funds	M acres	335.5	309.0	92	356	87
	Land acquired						
	Purchase and donation	M acres	118.0	157.0	133	96	164
	Exchanges	M acres	69.9	70.1	100	119	59
	Landline location	Miles	4,402.0	4,076.0	93	4,376	93

1/ M = thousand, MM = million, B = billion, RVD = recreation visitor day.

2/ Does not include accomplishments from contributed funding sources.

3/ Average from 1989 to 1992.

4/ K-V = Knutson Vandenberg Act.

5/ Average from 1990 to 1992.

6/ Includes 98,369 acres of certified natural regeneration without site preparation.

7/ Includes Tongass Timber Supply funds (\$1,963,600), 2.5 miles of construction, and 9 bridges.

8/ Includes miles turned back to the Forest Service for construction or reconstruction (purchaser election program).

Table 2—National Forest System funding—fiscal year 1992 compared to long-term program costs

	1992 Actual	1995 RPA1/ 1,000 constant 1992 dollars	Percent of 1992 Actual to 1995 RPA
Minerals area management	34,332	46,996	73
Real estate management	(35,430)	- 2/	N/A 3/
Landline location	(32,251)	-	N/A
Real estate management and landline location	67,681	97,195	70
Maintenance of facilities	26,283	30,974	85
Cooperative law enforcement	8,377	46,996 4/	18
Forest road maintenance	85,891	128,170	67
Recreation use	(216,396) 5/	-	N/A
Forest trail maintenance	(30,549) 5/	-	100
Recreation use and trail maintenance	246,945	246,726	100
Sales administration and management	263,745 5/	286,245	92
Reforestation and stand improvement	96,521 6/	75,834	127
Wildlife and fish habitat management	112,500 5/	162,348	69
Range management	(43,153)	-	N/A
Range betterment fund	(4,795)	-	N/A
Range management and range betterment fund	49,948	64,085	78
Soil, water and air management	76,243	77,970	98
Subtotal	1,068,466	1,263,539	85
General Administration (subtotal)	303,786	353,534	86
Forest fire protection	187,411	210,412	89
Fighting forest fires	110,589	139,918	79
Subtotal	298,000	350,330	85
Youth Conservation Corps (subtotal)	(1,000)	-	N/A
Construction:			
Construction of facilities 7/	77,497	-	N/A
Forest road construction	168,989	-	N/A
Forest trail construction	21,667 5/	-	N/A
Forest roads purchaser construction 8/	(113,000)	-	N/A
Subtotal	268,153	-	N/A

See footnotes at end of table.

	1992 Actual	1995 RPA1/	Percent of 1992 Actual to 1995 RPA
Land acquisition	88,306	-	N/A
Acquisition of lands for National Forests, special acts	1,134	-	N/A
Acquisition of lands to complete land exchange	1,230	-	N/A
Early Winters land exchange	0	-	N/A
Gifts, donations and bequests	96	-	N/A
Permanent appropriations	550,562	-	N/A
Trust funds	303,379	-	N/A
Subtotal	944,707	-	N/A
Total	2,886,671	N/A	N/A

1/ Information from 1990 RPA Program.

2/ - = Data not available.

3/ Not applicable.

4/ Includes NFS, cooperative, and drug enforcement/law enforcement activities.

5/ Includes excess timber receipt dollars.

6/ Includes reforestation trust fund dollars.

7/ Excludes construction of research facilities.

8/ This account was taken off budget in 1982. For comparison, the amounts are shown as non-add items.

Table 3—National Forest System funding—fiscal years 1988-92

	1992	1991 1/	1990	1989	1988
	<i>1,000 dollars actual</i>				
Minerals area management	34,332	30,380	28,414	28,439	26,683
Real estate management	35,430	31,192	25,973	25,503	21,834
Landline location	32,251	29,844	30,710	28,678	26,651
Maintenance of facilities	26,283	24,866	21,142	17,553	16,533
Cooperative law enforcement	8,377	15,538	11,082	10,615	9,669
Forest road maintenance	85,891	91,303	96,384	80,729	83,740
Forest trail maintenance	30,549	28,228	24,459	20,797	20,026
Sales administration and management	263,745	263,133	251,796	229,476	185,561
Reforestation and stand improvement 2/	96,521	101,960	99,995	102,597	84,923
Recreation use	216,396	198,817	153,613	142,254	123,742
Wildlife and fish habitat management	112,500	106,626	81,500	64,994	47,444
Range management	43,153	39,473	32,966	30,567	29,225
Soil, water and air management	76,243	72,153	61,612	57,429	35,271
Subtotal	1,061,671	1,033,513	919,646	839,631	711,302
General Administration (subtotal)	303,786	292,333	272,154	272,116	268,660
Forest fire protection	187,411	179,899	177,792	166,616	165,029
Fighting forest fires	110,589	118,035	611,850	125,000	125,000
Subtotal	298,000	297,934	789,642	291,616	290,029
Youth Conservation Corps (subtotal) 3/	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)
Construction					
Construction of facilities 4/	77,497	64,204	36,185	33,914	24,735
Forest road construction	168,989	173,072	164,356	175,657	171,764
Forest trail construction	21,667	21,479	18,611	15,947	14,671
Forest roads purchaser construction 5/	(113,000)	(118,690)	(120,310)	(120,770)	(119,508)
Subtotal	268,153	258,755	219,152	225,518	211,170

See footnotes at end of table.

Table 3--National Forest System funding--fiscal years 1988-92--Continued

	1992	1991 1/	1990	1989	1988
	<i>1,000 dollars actual</i>				
Land acquisition					
Acquisition of lands for National Forests, special acts	88,306	88,695	63,433	64,205	49,076
Acquisition of lands to complete land exchange	1,134	1,097	1,045	966	966
Early Winters land exchange	1,230	105	13	335	385
Gifts, donations and bequests	0	497	0	0	0
Range betterment 3/	96	1	3	90	3
Permanent appropriations	4,795	4,546	4,915	3,946	3,605
Trust funds	550,562	569,144	638,040	474,117	452,270
	303,379	281,974	260,137	267,748	296,334
Total	2,881,112	2,828,594	3,168,180	2,440,288	2,283,800

1/ Post sequestration with supplemental.

2/ Includes reforestation trust fund dollars.

3/ Appropriations Act required minimum level of funding from National Forest funds; amounts not included in totals.

1988 - operated a \$3.0 million program from available funds.

1989 - operated a \$2.2 million program from available funds.

1990 - operated a \$2.1 million program from available funds.

1991 - operated a \$1.8 million program from available funds.

1992 - operated a \$2.5 million program from available funds.

4/ Excludes construction of research facilities.

5/ This account was taken off budget in 1982. For comparison, the amounts are shown as non-add items.

Table 4—Summary of National Forest System 1992 accomplishments compared to long-term program trends

Resource area	Activity	Units 1/	1992 Actual	1995 RPA 2/	1991 Actual	Percent of change comparisons	
						1991 Actual to 1992 Actual	1992 Actual to 1995 RPA
Final output 3/							
Timber	Sales offering	B board ft	5.1	10.8	6.2	-18	112
Recreation	Visitor use 4/	MM RVD's	287.7	308.0	278.8	3	7
Range	Permitted grazing	MM AUM's	9.3	9.3	9.5	-2	0
Minerals	Applications, proposals, and administration	M cases	25.5	37.9	25.3	1	49
Wildlife & fish	User-days of recreation	MM WFUD's	44.4	48.9	42.7	4	10
		MM AD's	105.2	-	-	-	-
Intermediate output 6/							
Timber	Reforestation 7/	M acres	482.0	416.0	488.7	-1	-14
	Timber stand improvement 7/	M acres	353.1	323.0	393.7	-10	-9
Wildlife & fish	Habitat improvement	M acres	495.7	8/	444.6	8/	11
	Habitat improvement	Structures	38,009.0	8/	67,917.0	8/	-44
	Habitat inventory	M acres	13,252.5	8/	14,812.7	8/	-11
Wilderness	Management	MM acres	34.0	35.3	33.6	1	4
Soil & water	Resource improvement	M acres	36.2	8/	34.4	8/	5
	Soil inventory	M acres	6,464	8/	7,404.4	-13	-
Range	Forage improvements	M acres	108.3	8/	106.4	8/	2
	Forage improvements	Structures	4,157.0	8/	3,378.0	8/	23
Trails	Construction/reconstruction	Miles	1,975.6	2,396.0	1,921.3	3	21
Roads	Construction/reconstruction	Miles	4,439.9	11/	5,024.3	11/	-12
Fire	Fuels management	M acres	594.0	12/	698.5	12/	-15
Lands	Purchase and donation	M acres	161.7	-	67.9	9/	138

1/ B = billion, MM = million, M = thousand, RVD's = recreation visitor-days, AUM's = animal unit months, WFUD's = wildlife and fish user days, AD's = wildlife and fish activity days.

2/ Information derived from 1990 RPA Program.

3/ Final output = forest and rangeland goods and services purchased or consumed by the private sector or individual consumers.

4/ WFUD's are included in RVD's.

5/ Reported as operations in the 1990 RPA Program.

6/ Intermediate output = work performed by the Forest Service that contributes to the production of final outputs.

7/ Includes acres from carryover funds, and does not include accomplishments from contributed funds.

8/ Acres accomplished with appropriated funds, excess timber receipt funds, and K-V funds.

9/ These items were not reported in the RPA Program.

10/ Does not include trail reconstruction.

11/ Includes appropriated and purchaser roads.

12/ Includes accomplishments from appropriated funds and brush disposal funds.

Table 5—Draft and final forest plan environmental impact statements filed with the Environmental Protection Agency by Region as of September 30, 1992 1/

Northern Region	Rocky Mountain Region	Southwestern Region	Intermountain Region
<i>Final</i>	<i>Final</i>	<i>Final</i>	<i>Final</i>
Flathead (MT)	Rio Grande (CO) 2/	Cibola (NM)	Bridger-Teton (WY)
Lewis & Clark (MT)	Nebraska (NE)	Tonto (AZ)	Boise (ID)
Beaverhead (MT)	Bighorn (WY)	Carson (NM)	Uinta (UT)
Helena (MT)	Arapaho-Roosevelt (CO) 2/	Coronado (AZ)	Wasatch-Cache (UT)
Lolo (MT)	Grand Mesa, Uncompahgre, and Gunnison (CO)	Gila (NM)	Targhee (ID) 2/
Bitterroot (MT)	Routt (CO)	Lincoln (NM)	Caribou (ID)
Custer (MT)	San Juan (CO)	Prescott (AZ)	Fishlake (UT)
Deerlodge (MT)	Black Hills (SD) 2/	Apache-Sitgreaves (AZ)	Toiyabe (NV)
Nez Perce (ID)	White River (CO)	Coconino (AZ)	Dixie (UT)
Gallatin (MT)	Pike-San Isabel (CO)	Santa Fe (NM)	Humboldt (NV)
Idaho Panhandle (ID)	Medicine Bow (WY)	Kaibab (AZ)	Payette (ID)
Clearwater (ID)	Shoshone (WY)		Challis (ID)
Kootenai (MT)			Ashley (UT)
			Sawtooth (ID)
			Manti-LaSal (UT)
			Salmon (ID)
Pacific Southwest Region	Pacific Northwest Region	Southern Region	Eastern Region
<i>Draft</i>	<i>Final</i>	<i>Final</i>	<i>Final</i>
Klamath (CA) 3/	Deschutes (OR)	Francis Marion (SC) 2/	Hoosier (IN)
Shasta-Trinity (CA) 3/	Okanogan (WA)	Sumter (SC)	Nicolet (WI)
Mendocino (CA) 3/	Wallowa-Whitman (OR)	Mississippi (MS)	Superior (MN)
Six Rivers (CA) 3/	Wenatchee (WA)	Kisatchie (LA)	Monongahela (WV)
	Olympic (WA)	Chattahoochee-Oconee (GA)	Chippewa (MN)
<i>Final</i>	Siuslaw (OR)	Daniel Boone (KY)	Allegheny (PA)
Cleveland (CA)	Umatilla (OR)	Jefferson (VA)	Huron-Manistee (MI)
Angeles (CA)	Gifford Pinchot (WA)	George Washington (VA) 4/	Chequamegon (WI)
Plumas (CA)	Mt. Hood (OR)	Caribbean (PR) 2/	Mark Twain (MO)
Sequoia (CA)	Umpqua (OR)	Cherokee (TN)	Hiawatha (MI)
Los Padres (CA)	Malheur (OR)	Ozark-St. Francis (AR)	Ottawa (MI)
Inyo (CA)	Rogue River (OR)	Florida (FL) 2/	White Mountain (NH)
Eldorado (CA)	Mt. Baker (WA)	Ouachita (AR)	Green Mountain (VT)
San Bernardino (CA)	Winema (OR)	Alabama (AL)	Shawnee (IL)
Lake Tahoe Basin Management Unit (CA)	Willamette (OR)	Croatan-Uwharrie (NC)	Wayne (OH)
Tahoe (CA)	Colville (WA)	Nantahala-Pisgah (NC)	
Modoc (CA)	Siskiyou (OR)	Texas (TX)	
Stanislaus (CA)	Fremont (OR)		
Sierra (CA)	Ochoco (OR)		
Lassen (CA) 5/			
			Alaska Region
			<i>Final</i>
			Chugach (AK)
			Tongass (AK) 4/

1/ Includes forest plans filed in previous years.

2/ Plans in revision process with Notice of Intent issued.

3/ Withdrew previous draft due to spotted owl listing; will issue revised draft spring 1993.

4/ Revised plans issued in draft.

5/ Record of Decision to be signed December 1992.

Table 6—Lands administered by the Forest Service as of September 30, 1992

State, Commonwealth, or Territory 1/	National Forests, purchase units, research areas, and other areas	National Grasslands	Land utilization projects	Total
<i>Acres</i>				
Alabama	658,755	0	40	658,795
Alaska	22,193,395	0	0	22,193,395
Arizona	11,246,668	0	0	11,246,668
Arkansas	2,528,906	0	0	2,528,906
California	20,597,538	18,425	0	20,615,963
Colorado	13,838,233	628,379	0	14,466,612
Connecticut	24	0	0	24
Florida	1,135,306	0	0	1,135,306
Georgia	860,332	0	0	860,332
Hawaii	1	0	0	1
Idaho	20,392,815	47,749	0	20,440,564
Illinois	268,452	0	0	268,452
Indiana	189,378	0	0	189,378
Kansas	0	108,175	0	108,175
Kentucky	673,322	0	0	673,322
Louisiana	601,398	0	0	601,398
Maine	52,860	0	0	52,860
Michigan	2,848,183	0	959	2,849,142
Minnesota	2,814,624	0	0	2,814,624
Mississippi	1,152,741	0	0	1,152,741
Missouri	1,465,279	0	13,104	1,478,383
Montana	16,806,126	0	0	16,806,126
Nebraska	257,491	94,435	0	351,926
Nevada	5,801,183	0	0	5,801,183
New Hampshire	721,409	0	0	721,409
New Mexico	9,185,327	136,417	240	9,321,984
New York	13,327	0	0	13,327
North Carolina	1,233,878	0	0	1,233,878
North Dakota	743	1,105,043	0	1,105,786
Ohio	211,891	0	0	211,891
Oklahoma	254,257	46,286	0	300,543
Oregon	15,542,879	111,352	856	15,655,087
Pennsylvania	513,103	0	0	513,103
Puerto Rico	27,831	0	0	27,831
South Carolina	608,725	0	0	608,725
South Dakota	1,144,793	868,181	0	2,012,974
Tennessee	627,730	0	0	627,730
Texas	637,109	117,531	0	754,640
Utah	8,098,644	0	0	8,098,644
Vermont	345,367	0	0	345,367
Virgin Islands	147	0	0	147
Virginia	1,647,670	0	0	1,647,670
Washington	9,159,338	0	738	9,160,076
West Virginia	1,025,341	0	0	1,025,341
Wisconsin	1,518,179	0	0	1,518,179
Wyoming	8,682,526	572,211	0	9,254,737
Total	187,583,224	3,854,184	15,937	191,453,345

1/ Unlisted states have no lands administered by the Forest Service.

Table 7--Miles of landline location by Region--fiscal year 1992

Region	Total miles boundary	1992 mileage accomplishment	Total miles surveyed
Northern	30,664	551	8,599
Rocky Mountain	51,433	568	6,308
Southwestern	19,991	196	6,963
Intermountain	28,659	199	5,404
Pacific Southwest	29,577	581	13,402
Pacific Northwest	25,627	535	15,413
Southern	42,280	634	38,605
Eastern	42,642	748	11,252
Alaska 1/	1,536	64	1,354
Total	272,409	4,076	107,300

1/ Does not reflect changes due to Alaska Native Claims Settlement Act of 1971 (85 Stat. 688), as amended, and the Alaska Statehood Act of 1958 (72 Stat. 339), as amended. As the land selections are overlapping and/or in a constant state of change, the Region is not keeping track of the boundary changes at this time.

Table 8--Land acquisition and exchange--fiscal year 1992

	Acres	Cases	Value
			<i>Million dollars</i>
Purchase	157,018 1/	520	95.3
Exchange	69,102 2/	109	37.8
Donations and contributions	4,722	23	2.5
Total	230,842	652	135.6

1/ Includes 156,592 acres purchased through L&WCF and 426 acres through Acquisitions, Special Acts.

2/ Includes 37 acres of Sisk Act acquisitions.

Table 9--Wildlife and fish habitat inventory and improvement by Region--fiscal year 1992 1/

Region	Wildlife	Inland fish	Anadromous fish	Threatened, endangered & sensitive species	Total	
Northern						
Acres of inventory	329,916	9,080	1,007	124,386	464,389	
Acres of improvement	8,730	416	145	1,723	11,014	
Structures	181	489	182	99	951	
Rocky Mountain						
Acres of inventory	182,905	10,712	-	152,629	346,246	
Acres of improvement	13,590	239	-	7	13,836	
Structures	572	288	-	24	884	
Southwestern						
Acres of inventory	567,378	102,007	-	972,304	1,641,689	
Acres of improvement	12,268	5,365	-	8,791	26,424	
Structures	545	2,258	-	53	2,856	
Intermountain						
Acres of inventory	649,100	2,098	828	4,345,310	4,997,336	
Acres of improvement	11,191	197	178	15,034	26,600	
Structures	217	670	220	87	1,194	
Pacific Southwest						
Acres of inventory	158,634	5,948	7,115	2,650,374	2,822,071	
Acres of improvement	7,555	375	721	859	9,510	
Structures	525	360	341	115	1,341	
Pacific Northwest						
Acres of inventory	132,038	4,902	60,376	802,337	999,653	
Acres of improvement	4,763	192	2,372	747	8,074	
Structures	984	376	2,499	283	4,142	
Southern						
Acres of inventory	- 2/	-	-	-	-	
Acres of improvement	36,013	4,239	-	62,990	103,242	
Structures	873	1,371	-	1,220	3,464	
Eastern						
Acres of inventory	293,478	18,335	1,037	248,150	561,000	
Acres of improvement	19,567	4,000	387	4,681	28,635	
Structures	2,470	1,315	498	692	4,975	
Alaska						
Acres of inventory	228,150	340	537,354	517,299	1,283,143	
Acres of improvement	1,016	116	7,014	7,280	15,426	
Structures	27	8	64	30	129	
Total 3/						
Acres of inventory	2,541,599	153,422	607,717	9,812,789	13,115,527	4/
Acres of improvement	114,693	15,139	10,817	102,112	242,761	5/
Structures	6,394	7,135	3,804	2,603	19,936	6/

1/ Includes activities accomplished with appropriated Protection and Maintenance Funds.

2/ Acres of inventory not reported for the Southern Region.

3/ May not add due to rounding.

4/ In addition, 1,337,546 acres were inventoried with contributed funds, 33,045 with timber sale (K-V) funds, and 103,952 with excess timber receipts.

5/ In addition, 48,215 acres were improved with contributed funds, 236,943 with timber sale (K-V) funds, and 16,045 with excess timber receipts.

6/ In addition, 5,910 structures were completed with contributed funds, 17,276 with timber sale (K-V) funds, and 797 with excess timber receipts.

Table 10--Total recreation use on National Forest System lands by State--fiscal years 1988-92

State, Commonwealth, or Territory 1/	1992	1991	1990	1989	1988
	<i>1,000 RVD's 2/</i>				
Alabama	700.6	676.7	698.1	685.5	741.4
Alaska	5,887.5	5,717.9	5,413.6	4,636.2	4,354.5
Arizona	25,543.7	21,548.8	19,038.5	18,997.5	18,831.2
Arkansas	2,153.0	2,109.0	2,440.9	2,377.0	2,358.5
California	67,614.1	65,220.8	61,006.6	63,685.3	59,516.9
Colorado	29,053.0	25,998.0	25,204.2	23,238.2	21,484.0
Florida	3,104.4	3,080.8	2,961.2	2,851.5	2,787.5
Georgia	2,993.3	2,839.1	2,833.3	2,715.1	2,707.0
Idaho	13,086.8	12,908.5	11,819.1	11,738.3	10,736.3
Illinois	899.5	843.4	1,637.7	950.1	891.5
Indiana	551.8	594.0	568.8	587.6	430.1
Kansas	75.5	66.1	61.3	48.0	38.2
Kentucky	2,112.5	2,111.5	2,446.5	2,327.0	2,301.3
Louisiana	507.1	486.4	527.3	512.7	502.3
Maine	60.7	60.7	57.7	52.8	47.6
Michigan	4,755.0	8,153.0	4,916.4	4,725.4	4,319.6
Minnesota	5,738.5	4,956.4	5,399.3	5,147.6	4,449.6
Mississippi	1,297.5	1,285.1	1,177.1	1,236.9	1,240.4
Missouri	1,803.4	1,742.3	1,712.6	1,704.8	1,705.0
Montana	11,046.3	10,595.3	9,703.6	9,412.5	8,843.7
Nebraska	200.1	147.1	148.7	142.0	181.1
Nevada	3,360.0	3,283.1	3,277.9	3,081.5	2,656.8
New Hampshire	3,036.9	4,013.5	2,675.6	2,683.7	2,783.0
New Mexico	8,602.6	8,065.3	7,704.2	7,465.6	7,227.5
New York	31.2	45.0	71.5	22.4	25.6
North Carolina	5,767.3	5,691.8	5,472.0	5,036.2	4,973.2
North Dakota	142.2	198.6	168.5	184.3	186.7
Ohio	671.7	521.6	504.4	429.5	410.7
Oklahoma	368.8	373.0	386.8	341.4	331.4
Oregon	19,898.0	21,036.5	21,035.7	18,231.1	19,598.1
Pennsylvania	2,942.0	2,976.5	2,631.2	2,605.1	2,621.4
Puerto Rico	289.3	280.1	185.6	396.0	399.7
South Carolina	950.3	942.8	816.1	974.5	916.5
South Dakota	3,243.7	3,095.4	2,965.5	2,737.3	2,734.9
Tennessee	2,977.5	2,923.8	2,826.0	2,655.3	2,561.7
Texas	2,273.4	2,253.1	2,154.8	2,057.1	1,863.6
Utah	18,413.2	13,336.7	12,744.1	13,312.8	14,454.8
Vermont	1,564.7	1,570.5	1,368.9	1,352.3	1,154.1
Virginia	4,268.8	4,173.4	3,900.1	3,946.3	3,804.0
Washington	18,739.9	22,458.0	22,451.1	18,017.7	15,477.6
West Virginia	1,264.1	1,339.8	1,234.4	1,146.3	1,152.1
Wisconsin	2,185.1	2,215.3	2,094.9	1,978.6	2,000.1
Wyoming	7,515.5	6,914.3	6,608.8	6,068.0	6,514.5
Total	287,690.5	278,849.0	263,050.6	252,495.0	242,315.7

1/ States not listed have no Forest Service recreation program.

2/ One recreation visitor-day (RVD) is the recreation use of National Forest land or water that aggregates 12 visitor-hours. This may entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittent.

Table 11—State summary of total recreation use on National Forest System lands by activity—fiscal year 1992

State, Commonwealth, or Territory 1/	Camping, picnicking & swimming	Mechanized travel & viewing scenery	Hiking, horseback riding & water travel	Winter sports	Resorts, cabins & organization camps
<i>1,000 RVD's 2/</i>					
Alabama	204.0	114.6	65.0	0.0	0.4
Alaska	320.9	3,652.2	381.4	135.8	170.7
Arizona	6,626.4	11,413.6	1,451.2	421.9	943.7
Arkansas	609.6	533.9	203.0	0.1	24.2
California	18,261.9	24,827.2	4,582.6	3,956.9	7,621.5
Colorado	6,179.6	8,598.1	2,404.4	6,632.0	744.8
Florida	1,718.2	478.8	175.0	0.0	215.3
Georgia	899.7	955.9	384.9	0.8	44.9
Idaho	3,867.0	3,597.1	1,160.0	759.8	672.9
Illinois	180.9	348.9	140.8	0.8	7.5
Indiana	242.9	69.4	66.1	0.0	0.0
Kansas	15.5	26.5	2.5	0.0	1.9
Kentucky	644.3	666.3	260.0	2.3	21.4
Louisiana	152.2	130.9	16.1	0.0	26.7
Maine	19.4	8.6	13.0	1.2	2.4
Michigan	1,230.2	1,662.6	315.8	72.4	150.7
Minnesota	1,888.2	1,004.4	883.8	82.1	459.0
Mississippi	245.2	337.7	121.4	0.0	8.3
Missouri	524.2	532.5	239.3	0.0	10.6
Montana	2,227.0	3,465.9	1,361.8	663.4	369.8
Nebraska	45.6	45.7	16.6	0.5	38.7
Nevada	987.7	990.9	386.9	310.7	151.9
New Hampshire	698.4	1,139.5	346.6	629.7	120.3
New Mexico	2,748.4	2,017.4	793.5	778.9	278.1
New York	16.2	2.5	3.6	1.5	0.0
North Carolina	1,466.1	2,090.7	842.3	8.0	96.9
North Dakota	15.2	37.7	12.4	0.9	0.0
Ohio	109.7	145.3	73.8	0.8	0.0
Oklahoma	49.5	173.8	27.2	0.2	0.1
Oregon	6,393.0	7,524.3	1,585.8	612.4	1,333.5
Pennsylvania	843.7	1,310.2	258.8	9.3	68.8
Puerto Rico	109.1	100.1	23.3	0.0	7.0
South Carolina	254.1	219.8	135.1	0.0	0.4
South Dakota	200.9	2,455.6	161.2	16.6	115.4
Tennessee	1,176.7	865.9	325.7	4.9	94.1
Texas	621.5	425.1	98.2	0.0	22.6
Utah	5,130.6	7,190.0	1,169.9	1,076.2	789.0
Vermont	107.5	284.6	68.5	832.8	58.1
Virginia	1,025.9	1,364.0	426.9	9.3	20.7
Washington	6,288.5	6,982.2	1,915.5	650.5	1,100.7
West Virginia	525.6	212.0	110.5	1.7	47.6
Wisconsin	531.6	747.2	86.7	28.8	20.3
Wyoming	1,808.3	2,166.0	1,142.1	341.4	618.9
Total	77,211.1	100,915.6	24,239.2	18,044.6	16,479.8

See footnotes at end of table.

Table 11—State summary of total recreation use on National Forest System lands by activity—fiscal year 1992--
Continued

Hunting	Fishing	Non-Consumptive Fish & Wildlife Use	Other recreation activities	Total	State, Commonwealth, or Territory 1/
1,000 RVD's 2/					
166.5	70.4	5.4	74.3	700.6	Alabama
148.0	445.3	37.3	595.9	5,887.5	Alaska
916.7	937.1	434.6	2,398.5	25,543.7	Arizona
518.5	110.5	25.3	127.9	2,153.0	Arkansas
1,582.6	3,145.2	482.4	3,153.8	67,614.1	California
1,791.9	1,648.2	138.2	915.8	29,053.0	Colorado
233.0	177.1	20.4	86.6	3,104.4	Florida
380.5	192.4	36.8	97.4	2,993.3	Georgia
1,024.3	913.8	115.4	976.5	13,086.8	Idaho
123.3	40.0	14.1	43.2	899.5	Illinois
69.1	81.4	5.2	17.7	551.8	Indiana
6.9	11.0	2.0	9.2	75.5	Kansas
207.0	206.7	10.0	94.5	2,112.5	Kentucky
103.6	39.0	1.5	37.1	507.1	Louisiana
8.7	4.4	1.4	1.6	60.7	Maine
623.9	490.7	15.7	193.0	4,755.0	Michigan
349.0	881.1	37.6	153.3	5,738.5	Minnesota
383.0	86.4	29.5	86.0	1,297.5	Mississippi
266.9	112.4	19.3	98.2	1,803.4	Missouri
1,073.0	877.4	121.1	886.9	11,046.3	Montana
18.6	5.2	0.2	29.0	200.1	Nebraska
197.7	69.9	70.9	193.4	3,360.0	Nevada
36.1	27.6	12.8	25.9	3,036.9	New Hampshire
631.0	320.5	150.4	884.4	8,602.6	New Mexico
4.1	1.3	0.6	1.4	31.2	New York
690.9	330.6	33.0	208.8	5,767.3	North Carolina
64.1	2.6	4.0	5.3	142.2	North Dakota
231.9	48.5	5.0	56.7	671.7	Ohio
65.5	20.3	14.2	18.0	368.8	Oklahoma
699.4	993.6	179.4	576.6	19,898.0	Oregon
199.0	156.9	21.3	74.0	2,942.0	Pennsylvania
0.0	0.0	1.9	47.9	289.3	Puerto Rico
208.7	52.2	15.8	64.2	950.3	South Carolina
96.3	58.3	6.5	132.9	3,243.7	South Dakota
237.3	180.2	27.4	65.3	2,977.5	Tennessee
233.1	784.2	17.1	71.6	2,273.4	Texas
895.0	903.4	56.3	1,202.8	18,413.2	Utah
87.3	21.3	30.9	73.7	1,564.7	Vermont
815.6	346.1	38.8	221.5	4,268.8	Virginia
543.9	497.5	177.7	583.4	18,739.9	Washington
194.6	118.7	6.7	46.7	1,264.1	West Virginia
228.5	396.0	8.3	137.7	2,185.1	Wisconsin
607.3	462.8	64.3	304.4	7,515.5	Wyoming
16,962.3	16,268.2	2,496.7	15,073.0	287,690.5	Total

1/ States not listed have no Forest Service recreation program.

2/ One recreation visitor-day (RVD) is the recreation use of National Forest land or water that aggregates 12 visitor-hours. This may entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittent.

Table 12--Trail miles on the National Forest System by State--fiscal years 1990-92 1/

State, Commonwealth, or Territory 2/	1992			1991			1990		
	Total	Constructed	3/ Maintained	Total	Constructed	3/ Maintained	Total	Constructed	3/ Maintained
Alabama	260.1	8.5	130.8	162.9	14.5	133.9	207	8	164
Alaska	833.3	9.7	492.4	867.2	7.5	452.8	879	10	469
Arizona	4,260.7	180.3	788.7	3,982.9	116.8	587.1	3,989	117	545
Arkansas	771.2	60.2	534.0	768.9	26.5	460.1	558	34	365
California	13,973.2	151.0	7,313.8	14,045.5	348.4	6,553.6	13,303	241	5,977
Colorado	9,358.0	131.1	4,746.6	9,307.3	148.3	4,444.5	8,655	225	5,263
Florida	350.8	6.0	223.1	341.3	0.0	341.3	345	9	345
Georgia	700.0	1.0	280.8	626.3	4.6	486.0	627	4	498
Idaho	19,044.6	175.5	10,396.4	18,459.7	133.6	9,672.3	17,990	118	8,704
Illinois	220.0	13.5	49.7	157.0	14.5	79.7	339	14	73
Indiana	146.0	0.0	146.0	146.0	6.0	146.0	140	10	140
Kansas	37.5	2.0	14.5	36.9	0.0	13.9	36	0	14
Kentucky	466.7	18.9	205.4	462.0	23.7	441.6	487	10	487
Louisiana	132.1	12.0	107.0	142.1	3.0	134.5	138	0	138
Maine	120.0	0.0	120.0	120.0	5.0	120.0	171	1	171
Michigan	2,920.8	99.0	2,497.4	3,193.6	110.3	2,613.4	2,428	90	1,940
Minnesota	2,649.0	53.5	2,649.0	2,600.5	14.0	2,600.5	2,587	53	2,587
Mississippi	298.4	32.0	182.9	254.9	1.0	223.6	276	9	196
Missouri	650.0	63.5	619.0	628.0	22.7	628.0	1,308	25	987
Montana	14,492.3	163.3	9,169.2	14,135.9	110.7	9,383.1	13,854	127	7,714
Nebraska	54.0	1.0	41.0	50.0	0.0	50.0	50	0	50
Nevada	1,639.9	9.0	654.0	1,631.5	12.6	853.8	1,635	13	497
New Hampshire	1,308.0	47.8	1,308.0	1,308.0	6.9	1,308.0	1,308	3	1,047
New Mexico	4,126.7	63.9	1,270.1	3,942.0	37.4	886.0	4,270	19	1,298
New York	31.0	0.3	31.0	31.0	1.2	31.0	31	1	31
North Carolina	1,500.1	26.1	369.5	1,433.2	35.5	991.6	1,457	11	713
North Dakota	34.9	1.5	32.6	37.4	1.5	36.6	34	3	4
Ohio	260.0	30.0	260.0	260.0	20.0	260.0	240	49	240
Oklahoma	148.8	17.0	10.7	145.8	24.0	74.7	175	0	92
Oregon	11,008.3	105.2	8,303.8	10,530.4	211.0	5,862.7	10,133	130	6,787
Pennsylvania	648.8	22.0	555.4	648.8	8.6	334.9	646	24	252
Puerto Rico	21.1	2.5	6.0	26.0	0.0	26.0	26	2	17
South Carolina	316.6	23.3	226.0	373.7	31.3	299.5	258	27	258
South Dakota	234.2	12.3	223.2	251.3	18.3	241.3	231	8	231
Tennessee	716.2	7.9	104.1	673.7	12.5	152.4	663	17	663

See footnotes at end of table

Table 12--Trail miles on the National Forest System by State--fiscal years 1990-92--Continued

State, Commonwealth, or Territory 2/	1992			1991			1990		
	Total	Constructed	3/ Maintained	Total	Constructed	3/ Maintained	Total	Constructed	3/ Maintained
Texas	295.4	5.0	122.0	282.5	12.1	249.0	274	1	274
Utah	5,184.4	151.0	3,024.8	5,284.4	30.8	2,634.3	4,903	16	2,484
Vermont	965.2	20.4	769.9	965.2	30.7	711.4	965	4	200
Virginia	1,832.9	40.5	379.3	1,839.9	16.5	558.6	2,060	24	694
Washington	9,004.9	131.0	6,693.0	8,183.1	129.1	5,718.1	7,869	108	5,681
West Virginia	944.6	24.1	443.5	891.4	10.5	277.2	818	20	454
Wisconsin	1,684.6	31.0	1,349.2	1,314.5	44.6	1,136.3	1,670	21	1,261
Wyoming	6,638.2	21.8	2,988.1	6,041.8	114.8	3,349.3	6,334	31	3,102
Total 4/	120,283.5	1,975.6	69,831.9	116,584.5	1,921.0	65,558.6	114,366.4	1,634.9	63,103.9

1/ Includes work accomplished by Human Resource Programs and volunteers.

2/ States not listed have no Forest Service recreation program.

3/ Miles constructed include construction of new trails and reconstruction of existing trails. The predominant activity is reconstruction. Funds used are appropriated, other, and timber receipts.

4/ Totals may not add due to rounding.

Table 13—Additions to the National Wild and Scenic Rivers System--fiscal year 1992

River	State	Date	Miles
Cossatot	Arizona	4/22/92	15.5
Little Missouri	Arizona	4/22/92	15.7
Big Piney Creek	Arizona	4/22/92	45.2
Buffalo	Arizona	4/22/92	15.8
Hurricane Creek	Arizona	4/22/93	15.5
Mulberry	Arizona	4/22/92	56.0
North Sylamore Creek	Arizona	4/22/92	14.5
Richland Creek	Arizona	4/22/92	16.5
Sespe Creek	California	6/19/92	31.5
Sisquoc	California	6/19/92	33.0
Big Sur	California	6/19/92	19.5
Bear Creek	Michigan	3/03/92	6.5
Black	Michigan	3/03/92	14.0
Carp	Michigan	3/03/92	27.8
Indian	Michigan	3/03/92	51.0
Manistee	Michigan	3/03/92	26.0
Ontonagon	Michigan	3/03/92	157.4
Paint	Michigan	3/03/92	51.0
Pine	Michigan	3/03/92	25.0
Presque Isle	Michigan	3/03/92	57.0
Sturgeon (Hiawatha National Forest)	Michigan	3/03/92	43.9
Sturgeon (Ochaw National Forest)	Michigan	3/03/92	25.0
East Branch of the Tahquamenon	Michigan	3/03/92	13.2
Whitefish	Michigan	3/03/92	33.6
Yellow Dog	Michigan	3/03/92	4.0
Allegheny	Pennsylvania	4/20/92	85.0
Total			899.1

Table 14—Acres of the National Wilderness Preservation System by State--calendar years 1988-92 1/

State, Commonwealth, or Territory 2/	1992	1991	1990	1989	1988
<i>1,000 acres 3/</i>					
Alabama	33	33	33	33	33
Alaska	5,753	5,753	5,453	5,453	5,453
Arizona	1,345	1,345	1,345	1,345	1,338
Arkansas	117	117	116	115	115
California	4,302	3,902	3,902	3,921	3,921
Colorado	2,587	2,587	2,587	2,587	2,587
Florida	74	74	73	73	73
Georgia	113	89	89	89	89
Idaho	3,962	3,962	3,960	3,960	3,960
Illinois	26	26	0	0	0
Indiana	13	13	13	13	13
Kentucky	16	16	16	17	17
Louisiana	9	9	9	9	9
Maine	12	12	12	0	0
Michigan	92	92	92	92	92
Minnesota	803	802	799	799	798
Mississippi	6	6	5	6	6
Missouri	63	63	63	63	63
Montana	3,372	3,372	3,372	3,372	3,372
Nebraska	8	8	8	8	8
Nevada	786	786	788	65	65
New Hampshire	103	103	103	103	103
New Mexico	1,388	1,388	1,388	1,388	1,388
North Carolina	103	103	102	101	101
Oklahoma	14	14	14	14	14
Oregon	2,080	2,080	2,080	2,079	2,078
Pennsylvania	9	9	9	9	9
South Carolina	17	17	17	17	17
South Dakota	10	10	10	10	10
Tennessee	66	66	66	67	67
Texas	35	35	35	36	36
Utah	774	774	774	774	775
Vermont	59	59	59	59	59
Virginia	87	87	87	89	90
Washington	2,576	2,571	2,571	2,571	2,571
West Virginia	81	81	81	81	81
Wisconsin	42	42	42	42	42
Wyoming	3,080	3,080	3,080	3,080	3,081
Total 4/	34,017	33,586 5/	33,253	32,540	32,534

1/ Includes all changes to the Wilderness Preservation System through the 100th Congress.

2/ States not listed have no National Forest System acres in the National Wilderness Preservation System.

3/ Acreage for most states is estimated pending final map compilation; therefore, minor changes may occur between years.

4/ Total acreage is shown. The difference between the total and column sum is due to rounding.

5/ Correction in FY 1991: Boundary Peak on the Inyo National Forest in Nevada 10,000 acres should have been included.

Table 15--Additions to the National Wilderness Preservation System--fiscal year 1992

Public Law	State	Date	Number of new areas	Number of additions	Number of adjustments	Acres
102-217	Georgia	12/11/91	2	1	0	25,840
102-301	California	6/19/92	5	2	0	400,450
Total			7	3	0	426,290

Table 16--Fuels treatment acreage accomplished by appropriation--fiscal year 1992

Region	Accomplishment			Total
	Forest fire protection	Volunteer and contributed work	Brush disposal funds	
	<i>Acres</i>			
Northern	8,944	1,856	32,276	43,076
Rocky Mountain	10,670	0	10,559	21,229
Southwestern	29,800	0	68,871	98,671
Intermountain	9,627	0	24,634	34,261
Pacific Southwest	11,430	0	42,051	53,481
Pacific Northwest	13,215	130	127,538	140,883
Southern	197,779	0	0	197,779
Eastern	3,040	0	2,587	5,627
Alaska	200	0	0	200
Total	284,705	1,986	308,516	595,207

Table 17--Pesticide use report--fiscal year 1992

Common name	Target pest or purpose	Treatment Unit	Units treated	Quantity used
				Pounds 1/
Fungicides and fumigants:				
Benomyl	Greenhouse fungi	Square feet	36,000.0	1.5
	Nursery pests	Acres	186.9	190.9
	Nursery pests	Greenhouses	1.0	0.1
	Nursery pests	Seedings	7,360,250.0	224.0
	Seeding disease	Acres	4.1	15.0
	Seeding disease	Seedings	30,000.0	5.0
Borax	Fungi	Acres	36,989.3	27,473.8
	Fungi	Stumps	350.0	190.0
Captan	Nursery pests	Acres	7.0	10.5
Chlorothalonil	Nursery fungi	Acres	60.1	5,183.0
	Nursery blight	Acres	4.1	18.0
	Nursery fungi	Acres	82.0	170.3
	Nursery fungi	Ribes plants	80.0	0.3
	Nursery pests	Acres	6.7	13.9
	Other diseases	Acres	16.7	11.4
	Sirococcus tip blight	Acres	58.5	141.8
	Nursery fungi	Acres	93.7	31,789.0
Dazomet	Nursery pests	Acres	17.6	4,578.0
	DCNA	Fungi	Acres	29.6
Fungi		Greenhouses	1.0	10.2
Dodine	Fungi	Acres	5.2	7.8
Ethazol	Nursery root rot	Greenhouses	1.0	0.1
Maneb	Lophodermium needle blight	Acres	28.9	33.4
Metalaxyl	Nursery fungi	Acres	11.2	22.4
Methyl bromide	Nursery pests	Acres	72.1	13,211.0
Methyl bromide/ Chloropicrin	Nursery pests	Acres	145.7	53,685.0
Thiophamate-methyl	Nursery fungi	Acres	30.0	13.0
Thiram	Damping-off	Pounds of seed	500.0	1.6
Triadimefon	Rust fungi	Acres	82.0	12.1
	Rust fungi	Pounds of seed	983.0	1.0
Vinclozolin	Botrytis	Greenhouses	1.0	0.2
Zineb	Nursery fungi	Acres	1.0	1.0
Total 1992 fungicides and fumignats		Acres	37,932.3	
		Greenhouses	4.0	
		Pounds of seed	1,483.0	
		Ribes plants	80.0	
		Seedings	7,390,250.0	
		Sqaure feet	36,000.0	
		Stumps	350.0	
			Total Pounds	137,048.6

See footnotes at end of table.

Common name	Target pest or purpose	Treatment Unit	Units	Quantity
			treated	used
Pounds 1/				
Herbicides, algicides, and plant growth regulators:				
Arsenal	General weeds	Acres	3.0	6.0
Atrazine	Conifer release	Acres	6.0	18.0
Benefin	Rights-of-way	Acres	1.0	0.3
Bifenox	Nursery weeds	Acres	15.0	48.0
Bromacil/	General weeds	Acres	207.0	24.0
	Noxious	Acres	50.5	14.5
Chlorsulfuron	Noxious weeds	Acres	116.0	2.0
Clopyralid	Noxious weeds	Acres	376.0	409.5
Dacthal 2/	Nursery weeds	Acres	146.1	1,460.2
Dicamba	Noxious weeds	Acres	773.0	939.5
	Nursery weeds	Acres	8.3	7.5
Diuron	Noxious weeds	Acres	6.0	51.0
	Range management	Acres	2.0	16.0
	Rights-of-way	Acres	121.0	710.0
Endothall	Aquatic weeds	Acres	11.0	50.3
Fenvalerate	Nursery weeds	Acres	12.6	1.3
Fosamine	Rights-of-way	Acres	185.0	948.0
Fosamine ammonium	Rights-of-way	Acres	102.6	244.0
Fosamine/Imazapyr//Triclopyr	Rights-of-way	Acres	145.0	1,306.0
Glyphosate	Aquatic weeds	Acres	2.0	2.0
	Conifer release	Acres	4,925.3	6,016.7
	General weeds	Acres	380.6	802.9
	General weeds	Greenhouses	1.0	0.3
	General weeds	Side miles, roadsides	12.0	0.9
	Hardwood release	Acres	78.0	48.0
	Noxious weeds	Acres	1,372.9	1,234.5
	Nursery weeds	Acres	168.6	799.3
	Range management	Acres	53.0	57.0
	Rights-of-way	Acres	132.2	560.0
	Site preparation	Acres	2,713.0	1,640.0
	Wildlife habitat improvement	Acres	94.0	43.0
Glyphosate/Imazapyr	Conifer release	Acres	66.0	157.0
	Noxious weeds	Acres	51.0	210.4
	Site preparation	Acres	53.0	43.0
Glyphosate/Imazapyr/ Sulfometuron methyl	Conifer release	Acres	6.0	2.3
Glyphosate/Sulfometuron methyl	Conifer release	Acres	12.0	26.0
	General weeds	Acres	330.0	183.0
	Rights-of-way	Acres	12.0	18.8
	Site preparation	Acres	1,166.0	1,311.8
Glphosate/Triclopyr	Coniter release	Acres	1,790.0	2,440.0
	Site preparation	Acres	82.0	441.2

See footnotes at end of table

Table 17--Pesticide use report--fiscal year 1992--Continued

Common name	Target pest or purpose	Treatment Unit	Units	Quantity
			treated	used
Pounds 1/				
Herbicides, algicides, and plant growth regulators: (Continued)				
Hexazinone	Conifer release	Acres	5,597.0	9,557.0
	Hardwood release	Acres	1.1	13.6
	Site preparation	Acres	3,021.0	6,924.0
Hexazinone/Sulfometuron methyl	Conifer release	Acres	1,536.0	299.5
	Rights-of-way	Acres	330.0	92.5
	Site preparation	Acres	155.0	125.0
Hexazinone/Triclopyr	Conifer release	Acres	409.0	148.0
	Site preparation	Acres	432.0	1,300.0
Imazapyr	Conifer release	Acres	1,535.0	146.0
	Rights-of-way	Acres	96.0	56.7
	Site preparation	Acres	561.0	228.5
Imazapyr/Sulfometuron methyl	Conifer release	Acres	153.0	70.0
Imazapyr/Triclopyr	Conifer release	Acres	625.0	130.0
	Site preparation	Acres	1,589.0	1,568.0
Isoxaben	Nursery weeds	Acres	1.3	1.0
MSMA	Noxious weeds	Acres	124.0	50.0
	Site preparation	Acres	15.0	15.0
MSMA Sulfometuron methyl	Site preparation	Acres	69.0	76.5
Metsulfuron methyl	General weeds	Acres	60.0	15.0
	Noxious weeds	Acres	45.0	1.0
Napropamide	Nursery weeds	Acres	60.4	149.0
Oryzalin	Range management	Acres	3.0	5.0
Oxfluorfen	Nursery weeds	Acres	106.4	97.4
Picloram	Conifer release	Trees	100.0	0.6
	Noxious weeds	Acres	9,667.2	2,646.6
	Rights-of-way	Acres	65.0	2.0
Picloram/Triclopyr	Noxious weeds	Acres	31.0	85.0
	Site preparation	Acres	80.0	335.0
	Hardwood release	Acres	1.0	2.0
Prometon	Nursery weeds	Acres	39.0	16.0
Sethoxydim	Aquatic weeds	Acres	1.0	3.0
	General weeds	Acres	4.0	16.0
	Nursery weeds	Acres	1.0	12.8
Simazine	Range management	Acres	2.0	20.0
	Conifer release	Acres	1,331.0	30.3
	General weeds	Acres	27.0	4.3
Sulfometuron methyl	General weeds	Side miles, roadside	12.0	0.9
	Noxious weeds	Acres	36.0	27.0
	Rights-of-way	Acres	90.0	6.3
Sulfometuron methyl/Triclopyr	Site preparation	Acres	369.0	46.1
	Rights-of-way	Acres	330.0	132.0
Tebuthiuron	General weeds	Acres	33.5	171.0
	Range management	Acres	75.0	150.0
Triclopyr	Conifer release	Acres	17,147.0	15,747.2
	Conifer release	Acres	100.0	1.3
	General weeds	Acres	376.0	413.8
	Hardwood release	Acres	2,742.4	1,768.1
	Noxious release	Acres	114.0	456.0
	Rights-of-way	Acres	861.0	1,490.0

See footnotes at end of table.

Table 17--Pesticide use report--fiscal year 1992--Continued

Common name	Target pest or purpose	Treatment Unit	Units treated	Quantity used
				Pounds 1/
Herbicides, algicides, and plant growth regulators: (Continued)				
2,4-D	Rights-of-way	Posts	80.0	3.0
	Site preparation	Acres	19,474.0	19,326.5
	Wildlife habitat improvement	Acres	5,290.0	8,215.0
	General weeds	Acres	2.3	1.6
	Noxious weeds	Acres	2,911.9	3,178.8
	Nursery weeds	Acres	4.0	2.9
	Rights-of-way	Acres	1.0	1.0
2,4-D/Bromacil	Noxious weeds	Acres	35.0	55.5
2,4-D/Clopyralid	Noxious weeds	Acres	192.0	60.8
2,4-D/Dicamba	Noxious weeds	Acres	5,582.5	4,924.4
2,4-D/Dicamba/Picloran	Noxious weeds	Acres	172.0	114.3
2,4-D/Glphosate	Noxious weeds	Acres	319.0	137.5
2,4-D/Metaulfuron Methyl	Noxious weeds	Acres	64.0	80.0
2,4-D/Picloran	Noxious weeds	Acres	10,595.0	9,183.4
Velpar	Hardwood release	Acres	1.1	13.6
		Acres	110,666.8	
Total 1992 herbicides, algicides, and plant growth regulators		Greenhouses	1.0	
		Posts	80.0	
		Side miles, roadside	24.0	
		Trees	200.0	
				Total Pounds

See footnotes at end of table.

Table 17--Pesticide use report--fiscal year 1992--Continued

Common name	Target pest or purpose	Treatment Unit	Units treated	Quantity used	1/	
				Pounds		
Insecticides, acaricides, and pheromones:						
Acephate	Cone and seed insects	Acres	44.0	337.5		
	Imported fire ant	Acres	44.0	2.0		
	Miscellaneous insects	Acres	0.7	1.4		
	Western spruce budworm	Acres	30.0	0.7		
	Western spruce budworm	Trees	1,637.0	37.8		
Amidinohydrazone	Imported fire ant	Acres	1.0	1.0		
Bendiocrab	Fleas	Acres	320.0	80.0		
Bt 3/	Cone and seed insects	Acres	100.0	36.0 BIU	1/	
	Gypsy moth	Acres	82,737.0	24-32 BIU		
	Western spruce budworm	Acres	186,566.0	24.0 BIU		
	Western spruce budworm	Trees	9,500.0	32.0 BIU		
Carbaryl	Bark beetles	Acres	40.0	374.0		
	Bark beetles	Trees	500.0	92.0		
	Grasshoppers	Acres	6,314.0	95,564.0		
	Miscellaneous insects	Acres	2,443.0	1,496.0		
	Miscellaneous insects	Trees	13.0	2.3		
	Mountain pine beetle	Trees	74.0	165.5		
	Nursery insects	Acres	0.2	1.0		
	Western pine beetle	Acres	20.0	260.0		
Carbofuran	Tip moths	Trees	2,000.0	0.2		
Chlorpyrifos	Carpenter ant	Buildings	1.0	4.5		
	Southern pine beetle	Trees	2,275.0	94.0		
	Webworms	Acres	33.0	30.0		
Coumaphos	Miscellaneous insects	Head cattle	15,800.0	625.0		
Cyfluthrin	Carpenter ant	Buildings	1.0	0.7		
Diazinon	Aphids	Acres	50.5	68.1		
	Cutworms	Acres	9.5	38.0		
	Fleas	Acres	97.0	343.3		
	Miscellaneous insects	Acres	0.2	0.1		
	Nursery insects	Acres	53.0	44.0		
	White grub	Acres	12.0	22.0		
Diflubenzuron	Gypsy moth	Acres	60.0	1.8		
Dimethoate	Tip moths	Acres	22.0	9.0		
Dormant oil	Miscellaneous insects	Acres	0.5	1.5		
Esfenvalerate	Cone and seed insects	Acres	243.0	39.0		
Esfenvalerate/Bt	Cone and seed insects	Acres	520.0	13.1/31 BIU	1/	
Hydramethylnon	Imported fire ant	Latrines	293.0	94.0		
Kinoprene	Miscellaneous insects	Greenhouses	1.0	0.1		
Lindane	Cone moth	Acres	47.0	0.4		
	Miscellaneous insects	Grafts	800.0	0.4		
	Southern pine beetle	Acres	3.0	8.0		
	Southern pine beetle	Trees	648.0	6.6		

See footnotes at end of table.

Table 17--Pesticide use report--fiscal year 1992--Continued

Common name	Target pest or purpose	Treatment Unit	Units treated	Quantity used
				Pounds 1/
Insecticides, acaricides, and pheromones: (Continued)				
Malathion	Grasshoppers	Acres	8,175.0	4,471.5
	Miscellaneous insects	Greenhouses	2.0	7.1
	Seedbugs	Acres	82.0	131.0
Methyl bromide	Ants	Acres	10.0	56.0
Permethrin	Gypsy moth	Acres	2,707.0	61.5
	Seedbugs	Acres	17.0	6.0
Pesticidal soap	Aphids	Acres	2.0	7.2
Petroleum oil	Aphids	Acres	3.4	59.6
Pyrethrin	Miscellaneous insects	Buildings	100.0	0.1
Temephos	Miscellaneous insects	Buildings	2.0	56.0
Verbenone	Mountain pine beetle	Acres	10.0	0.8
	Mountain pine beetle	Bait stations	190.0	0.3
Total 1992 insecticides, acaricides, and pheromomes		Acres	290,817.0	
		Bait stations	190.0	
		Buildings	104.0	
		Grafts	800.0	
		Greenhouses	3.0	
		Head of cattle	15,800.0	
		Latrines	293.0	
		Trees	16,647.0	
			Total Pounds	18,748.3

See footnotes at end of table.

Table 17--Pesticide use report--fiscal year 1992--Continued

Common name	Target pest or purpose	Treatment Unit	Units treated	Quantity used
				Pounds 1/
Predacides, piscicides, and repellants:				
Antimycin	Undesirable fish	Acre feet	46.3	16.9
Putrescent egg solids	Deer	Acres	33,134.0	6,161.8
	Elk	Seedings	100.0	7.9
Rotenone	Undesirable fish	Acres	28.0	18.3
	Undesirable fish	Stream miles	40.0	2.0
Sodium cyanide	Coyotes	Acres	69,573.0	0.1
	Coyotes	Bait stations	20.0	0.1
Thiram	Birds	Pounds of seed	5,173.0	200.0
Total 1992 predacides, piscicides and repellants		Acre feet	46.3	
		Acres	102,735.0	
		Bait stations	20.0	
		Pounds of seed	5,173.0	
		Seedings	100.0	
		Stream miles	40.0	
			Total Pounds	6,406.9

See footnotes at end of table.

Common name	Target pest or purpose	Treatment Unit	Units treated	Quantity used
				Pounds 1/
Rodenticides:				
Aluminum phosphide	Prairie dogs	Acres	5.0	30.0
Chlorophacinone	Ground squirrel	Acres	30.0	0.6
Diphacinone	Ground squirrel	Acres	270.0	0.1
	Prairie dogs	Acres	165.5	0.0
Strychnine	Gophers and prairie dogs	Acres	55,499.6	185.7
Zinc phosphide	Mice	Acres	4.0	0.4
			Acre feet	46.3
Total 1992 rodenticides			Acres	598,125.2
			Bait stations	210.0
			Buildings	104.0
			Grafts	800.0
			Greenhouses	8.0
			Head of cattle	15,800.0
			Latrines	293.0
			Posts	80.0
			Pounds of seed	6,656.0
			Ribes plants	80.0
			Seedings	7,390,350.0
			Side miles, roadside	24.0
			Square feet	36,000.0
			Stream miles	40.0
			Stumps	350.0
			Trees	16,847.0
			Total Pounds	216.8
Grand total of pounds of pesticide use in 1992				274,426.5

1/ Pounds of active ingredient, unless other units are indicated. BIU = billion international units per acre.

2/ Registered trademark; no common name.

3/ Bt = *Bacillus thuringiensis*.

	Appropriated	Knutson-Vandenberg	Total
1988			
Million dollars 1/	54.9	133.2	188.1
1,000 acres	133.3 2/	282.8 3/	416.1
Constant dollars/acre	411.9	471.0	452.1 4/
1989			
Million dollars 1/	65.0 5/	129.5	194.5
1,000 acres	148.6	327.3	475.9 6/
Constant dollars/acre	437.4	395.7	408.7 4/
1990			
Million dollars 1/	54.5	125.0 7/	179.5
1,000 acres	145.0	353.1	498.1 8/
Constant dollars/acre	375.9	354.0	360.4 4/
1991			
Million dollars 1/	53.0	110.0	163.0
1,000 acres	138.2	350.5	488.7 9/
Constant dollars/acre	383.5	313.8	333.7 4/
1992			
Million dollars 1/	46.4	81.1	127.5
1,000 acres	162.6	319.4	482.0 10/
Constant dollars/acre	285.4	254.0	264.5 4/

1/ All dollars are constant 1992. No General Administration funds included. Does not include funds for nursery and tree improvement.

2/ Does not include the 24,900 acres of certified natural regeneration without site preparation reported as established in FY 1988.

3/ Does not include the 11,900 acres of certified natural regeneration without site preparation reported as established in FY 1988.

4/ Weighted average.

5/ Includes \$9.7 million of resource management excess timber receipts. These funds are to be used to reforest lands damaged by forest fires in 1987 and 1988.

6/ Includes 53,000 acres of certified natural regeneration without site preparation reported as established in FY 1989, but does not include 16,300 acres of other carryover reforestation.

7/ Although \$152 million were authorized, only \$125.0 were obligated. The cost/acre is based upon the obligated amount. The unspent funds were returned to the K-V trust pool for future obligations.

8/ Includes 59,000 acres of certified natural regeneration without site preparation reported as established in FY 1990.

9/ Includes 65,687 acres of certified natural regeneration without site preparation, but does not include 14,477 acres accomplished with contributed funding.

10/ Includes 98,369 acres of certified natural regeneration without site preparation, but does not include 9,973 acres accomplished with contributed funding.

Table 19—Reforestation program needs--fiscal years 1992-94

	Current or anticipated	Annual program appropriated funds 1/	
	1,000 acres	1,000 acres	Million dollars
10/1/91 balance	1,113		
Fiscal year 1992			
New needs 2/	449		
Accomplishments	-492	162.6	46.4
10/1/92 balance	1,069		
Fiscal year 1993			
New needs 2/	450		
Projected accomplishments	-475	116.7	47.0
10/1/93 balance	1,044		
Fiscal year 1994			
New needs 2/	400		
Projected accomplishments	-450		
10/1/94 balance	994		

1/ Includes Reforestation Trust Fund pursuant to P.L. 96-451, as amended.

2/ New needs are the results of timber harvests, regeneration failures, and natural disasters such as fires, storms, insects, diseases, and other changes.

Table 20—Reforestation needs as of October 1, 1992, by State, forest, and site productivity class

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	0-49	50-84	85-119	120+	
Alabama					
NFs in Alabama (subtotal)	17	1,366	4,145	397	5,925
Alaska					
Chugach	0	45	0	0	45
Tongass-Chatham	171	1,127	3,821	8,322	13,441
Tongass-Ketchikan	0	263	960	17,486	18,709
Tongass-Stikine	102	494	2,390	7,566	10,552
Subtotal	273	1,929	7,171	33,374	42,747
Arizona					
Apache-Sitgreaves	692	1,882	217	0	2,791
Coconino	13,556	4,670	0	0	18,226
Coronado	0	0	0	0	0
Kaibab	568	260	0	0	828
Prescott	118	0	0	0	118
Tonto	1,671	0	0	0	1,671
Subtotal	16,605	6,812	217	0	23,634
Arkansas					
Ouachita	48	3,682	5,588	39	9,357
Ozark-St. Francis	191	1,630	370	11	2,202
Subtotal	239	5,312	5,958	50	11,559
California					
Angeles	169	309	272	0	750
Cleveland	0	158	0	0	158
Eldorado	0	124	1,373	10,306	11,803
Inyo	0	315	100	0	415
Klamath	304	3,751	5,131	4,532	13,718
Lake Tahoe Basin	0	47	1,454	0	1,501
Lassen	61	10,648	3,321	2,594	16,624
Los Padres	5	76	0	0	81
Mendocino	321	2,607	1,928	854	5,710
Modoc	30	1,931	1,027	517	3,505
Plumas	0	908	13,842	1,339	16,089
Rogue River	0	205	368	0	573
San Bernardino	346	389	29	0	764
Sequoia	18	1,865	968	3,647	6,498
Shasta	0	171	719	3,132	4,022
Sierra	0	366	1,496	1,808	3,670
Siskiyou	0	0	895	0	895
Six Rivers	0	27	1,979	1,571	3,577

See footnotes at end of table.

Table 20--Reforestation needs as of October 1, 1992, by State, forest, and site productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	0-49	50-84	85-119	120+	
California (continued)					
Stanislaus	2,841	18,223	30,615	23,149	74,828
Tahoe	4	1,101	2,722	3,900	7,727
Toiyabe	23	0	0	0	23
Trinity	2	3,223	1,203	2,398	6,826
Subtotal	4,124	46,444	69,442	59,747	179,757
Colorado					
Arapaho and Roosevelt	9,462	288	0	0	9,750
Grand Mesa, Uncompahgre, and Gunnison	6,400	2,297	128	0	8,825
Pike and San Isabel	1,532	225	0	0	1,757
Rio Grande	559	851	151	0	1,561
Routt	7,437	2,284	42	0	9,763
San Juan	1,810	2,678	192	0	4,680
White River	1,020	908	44	0	1,972
Subtotal	28,220	9,531	557	0	38,308
Florida					
NFs in Florida (subtotal)	331	737	4,441	1,734	7,243
Georgia					
Chattahoochee and Oconee (subtotal)	0	206	4,389	597	5,192
Idaho					
Boise	2,901	17,463	4,743	2,726	27,833
Caribou	0	187	28	0	215
Challis	0	0	0	0	0
Clearwater	7,135	555	3,580	6,480	17,750
Idaho Panhandle	15,033	2,070	7,476	6,473	31,052
Kootenai	59	12	124	13	208
Lolo	0	0	0	0	0
Nez Perce	2,846	2,085	6,057	3,130	14,118
Payette	1,888	3,714	5,652	39	11,293
Salmon	8,821	386	0	0	9,207
Sawtooth	190	40	0	0	230
Targhee	438	14,901	0	56	15,395
Subtotal	39,311	41,413	27,660	18,917	127,301
Illinois					
Shawnee (subtotal)	0	345	230	0	575
Indiana					
Hoosier (subtotal)	0	0	1,147	590	1,737

See footnotes at end of table.

Table 20--Reforestation needs as of October 1, 1992, by State, forest, and site productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	0-49	50-84	85-119	120+	
Kentucky					
Daniel Boone (subtotal)	0	2,509	1,720	271	4,500
Louisiana					
Kisatchie (subtotal)	34	642	2,016	2,175	4,867
Maine					
White Mountain (subtotal)	0	12	21	12	45
Michigan					
Hiawatha	4,828	7,404	1,451	137	13,820
Huron-Manistee	3,960	2,978	539	38	7,515
Ottawa	1,749	12,385	2,043	155	16,332
Subtotal	10,537	22,767	4,033	330	37,667
Minnesota					
Chippewa	249	0	319	92	660
Superior	0	3,009	1,252	536	4,797
Subtotal	249	3,009	1,571	628	5,457
Mississippi					
NFs in Mississippi (subtotal)	219	1,645	4,156	6,480	12,500
Missouri					
Mark Twain (subtotal)	0	11,392	61	0	11,453
Montana					
Beaverhead	663	537	0	0	1,200
Bitterroot	2,734	1,168	377	19	4,298
Custer	3,437	553	221	0	4,211
Deerlodge	2,267	317	494	0	3,078
Flathead	11,477	1,903	3,730	708	17,818
Gallatin	841	1,601	34	8	2,484
Helena	3,720	349	174	4	4,247
Idaho Pandle	0	0	0	22	22
Kootenai	15,481	4,453	8,599	1,476	30,009
Lewis and Clark	2,481	461	56	0	2,998
Lolo	8,718	4,418	1,894	294	15,324
Subtotal	51,819	15,760	15,579	2,531	85,689
New Hampshire					
White Mountain (subtotal)	1,629	3,278	1,098	150	6,155

See footnotes at end of table.

Table 20--Reforestation needs as of October 1, 1992, by State, forest, and site productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	0-49	50-84	85-119	120+	
New Mexico					
Carson	237	0	0	0	237
Cibola	598	35	0	0	633
Gila	972	204	0	0	1,176
Lincoln	0	1,231	89	0	1,320
Santa Fe	2,561	901	0	0	3,462
Subtotal	4,368	2,371	89	0	6,828
New York					
Green Mountain (subtotal)	0	10	23	8	41
North Carolina					
NFs in North Carolina (subtotal)	392	2,614	619	313	3,938
Ohio					
Wayne (subtotal)	0	163	1,018	1,369	2,550
Oklahoma					
Ouachita (subtotal)	0	479	297	670	1,446
Oregon					
Deschutes	21,666	11,721	1,169	354	34,910
Fremont	8,340	10,268	296	45	18,949
Klamath	10	62	74	153	299
Malheur	3,620	24,340	0	0	27,960
Mt. Hood	782	9,296	3,454	1,826	15,358
Ochoco	16,072	5,291	142	0	21,505
Rogue River	0	1,846	7,769	278	9,893
Siskiyou	10	95	2,386	1,346	3,837
Siuslaw	0	0	0	1,851	1,851
Umatilla	1,177	14,428	1,544	1,679	18,828
Umpqua	148	2,053	3,602	2,625	8,428
Wallowa-Whitman	7,989	26,348	7,242	578	42,157
Willamette	48	1,397	3,732	6,461	11,638
Winema	6,770	19,540	7,695	662	34,667
Subtotal	66,632	126,685	39,105	17,858	250,280
Pennsylvania					
Allegheny (subtotal)	3,800	1,824	0	0	5,624
Puerto Rico					
Caribbean (subtotal)	0	0	41	118	159
South Carolina					
Francis Marion and Sumter (subtotal)	0	0	10,598	6,866	17,464

See footnotes at end of table.

Table 20--Reforestation needs as of October 1, 1992, by State, forest, and site productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	0-49	50-84	85-119	120+	
South Dakota					
Black Hills (subtotal)	25,289	5,888	0	0	31,177
Tennessee					
Cherokee (subtotal)	17	1,626	1,491	3,918	7,052
Texas					
NFs in Texas (subtotal)	0	4,761	4,318	493	9,572
Utah					
Ashley	15,186	0	0	0	15,186
Dixie	732	638	0	0	1,370
Fishlake	30	285	0	0	315
Manti-LaSal	0	380	100	0	480
Uinta	0	0	183	0	183
Wasatch-Cache	305	0	0	0	305
Subtotal	16,253	1,303	283	0	17,839
Vermont					
Green Mountain (subtotal)	40	137	255	20	452
Virginia					
George Washington	1,329	976	58	246	2,609
Jefferson	444	3,046	115	280	3,885
Subtotal	1,773	4,022	173	526	6,494
Washington					
Colville	2,092	7,517	2,818	247	12,674
Gifford Pinchot	0	3,251	8,997	1,454	13,702
Idaho Panhandle	109	0	730	36	875
Mt. Baker-Snoqualmie	0	361	1,367	752	2,480
Okanogan	2,773	3,721	1,459	0	7,953
Olympic	0	164	1,844	1,068	3,076
Umatilla	142	1,326	94	163	1,725
Wenatchee	479	1,881	4,791	287	7,438
Subtotal	5,595	18,221	22,100	4,007	49,923
West Virginia					
George Washington	69	3	10	149	231
Jefferson	0	0	0	0	0
Monongahela	73	696	1,160	323	2,252
Subtotal	142	699	1,170	472	2,483

See footnotes at end of table.

Table 20--Reforestation needs as of October 1, 1992, by State, forest, and site productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	0-49	50-84	85-119	120+	
Wisconsin					
Chequamegon	1,636	4,162	896	193	6,887
Nicolet	856	4,490	1,729	365	7,440
Subtotal	2,492	8,652	2,625	558	14,327
Wyoming					
Bighorn	1,465	419	0	0	1,884
Black Hills	8,206	8,774	38	0	17,018
Bridger-Teton	0	258	1,917	0	2,175
Medicine Bow	5,071	670	0	0	5,741
Shoshone	1,392	486	688	0	2,566
Targhee	0	0	0	0	0
Wasatch	0	112	0	0	112
Subtotal	16,134	10,719	2,643	0	29,496
Total	296,534	365,283	242,460	165,179	1,069,456

1/ Site productivity class refers to the amount of wood produced in cubic feet per acre per year in a natural unmanaged stand.

2/ States not listed had no reforestation needs as of October 1, 1992.

Table 21--Reforestation and timber stand improvement acreages certified as satisfactorily stocked by State and National Forest--fiscal year 1992

State, Commonwealth, or Territory 1/ National Forest	Reforestation					Timber stand improvement				
	Artificial regeneration		Natural regeneration			Fertili-				
	Planted	Seeded	w/site prep. 2/	w/o site prep. 2/	Total Acres	Cleaning	Release	Thinning	zation	Pruning
Alabama										
NFs in Alabama (subtotal)	2,854	0	762	0	3,616	0	3,073	0	0	0
Alaska										
Chugach	30	0	0	0	30	0	0	0	0	0
Tongass-Chatham	145	0	0	1,107	1,252	0	0	1,183	0	0
Tongass-Ketchikan	98	0	0	5,571	5,669	0	188	1,692	0	0
Tongass-Stikine	0	0	0	1,698	1,698	0	0	1,525	0	0
Subtotal	273	0	0	8,376	8,649	0	188	4,400	0	0
Arizona										
Apache-Sitgreaves	0	0	0	869	869	0	0	814	0	0
Coconino	0	0	0	0	0	0	0	200	0	0
Kaibab	196	0	52	0	248	0	0	192	0	0
Tonto	60	0	0	0	60	0	0	0	0	0
Subtotal	256	0	52	869	1,177	0	0	1,206	0	0
Arkansas										
Ouachita	9,132	0	779	919	10,830	0	3,347	485	0	0
Ozark-St. Francis	1,956	0	813	0	2,769	0	636	227	0	0
Subtotal	11,088	0	1,592	919	13,599	0	3,983	712	0	0
California										
Angeles	0	0	0	0	0	0	361	60	0	94
Cleveland	0	0	0	0	0	0	84	20	0	30
Eldorado	1,529	0	0	0	1,529	0	6,822	1,018	0	0
Inyo	0	0	0	0	0	0	141	606	0	0
Klamath	16,959	0	23	0	16,982	0	3,456	731	65	0
Lake Tahoe Basin	0	0	0	0	0	0	0	299	0	0
Lassen	0	0	0	0	0	0	1,578	2,886	0	0
Mendocino	746	0	0	0	746	0	4,456	1,080	771	68
Modoc	234	0	0	0	234	0	450	1,948	0	0
Plumas	1,456	0	17	81	1,554	0	2,052	2,212	0	0

See footnotes at end of table.

Table 21--Reforestation and timber stand improvement acreages certified as satisfactorily stocked by State and National Forest--fiscal year 1992--
Continued

State, Commonwealth, or Territory 1/ National Forest	Reforestation					Timber stand improvement				
	Artificial regeneration		Natural regeneration		Total Acres	Fertili-				Total Acres
	Planted	Seeded	w/site prep. 2/	w/o site prep. 2/		Cleaning	Release	Thinning	zation	Pruning
California (continued)										
San Bernardino	0	0	0	0	0	0	142	376	0	0
Sequoia	87	0	0	13	100	0	5,101	726	0	0
Shasta	1,627	0	693	0	2,320	0	3,175	275	0	0
Sierra	537	0	0	0	537	0	5,777	556	0	0
Siskiyou	432	0	0	0	432	0	0	0	0	0
Six Rivers	854	0	11	2	867	0	2,890	557	0	0
Stanislaus	265	0	3	0	268	0	4,720	0	0	0
Tahoe	4,569	0	108	201	4,878	0	5,002	1,221	0	0
Trinity	6,541	0	0	19	6,560	0	3,669	595	0	0
Subtotal	35,836	0	855	316	37,007	0	49,876	15,166	836	192
Colorado										
Arapaho and Roosevelt	0	0	93	2,115	2,208	0	0	0	0	0
Grand Mesa, Uncompahgre, and Gunnison	264	0	0	1,005	1,269	0	91	339	0	0
Manti-LaSal	0	0	0	0	0	0	0	130	0	0
Pike and San Isabel	25	0	0	439	464	0	432	40	0	0
Rio Grande	0	0	0	0	0	0	0	60	0	0
Routt	2	61	3	1,530	1,596	0	0	1,028	0	0
San Juan	12	0	0	348	360	0	213	287	0	0
White River	0	0	260	681	941	0	209	0	0	0
Subtotal	303	61	356	6,118	6,838	0	945	1,884	0	0
Florida										
NFs in Florida (subtotal)	7,756	2,884	0	1,185	11,825	0	592	117	2,262	0
Georgia										
Chattahoochee- Oconee (subtotal)	3,518	0	93	128	3,739	0	4,792	470	0	0
Idaho										
Boise	3,978	0	432	245	4,655	674	444	3,988	0	0
Caribou	205	136	202	0	543	170	0	92	0	0

See footnotes at end of table.

Table 21—Reforestation and timber stand improvement acreages certified as satisfactorily stocked by State and National Forest--fiscal year 1992--
Continued

State, Commonwealth, or Territory 1/ National Forest	Reforestation					Timber stand improvement				
	Artificial regeneration		Natural regeneration			Ferti-		Thinning		Total Acres
	Planted	Seeded	w/site prep. 2/	w/o site prep. 2/	Total Acres	Cleaning	Release	Thinning	Pruning	
Idaho (continued)										
Challis	0	0	0	144	144	0	0	0	0	0
Clearwater	1,433	0	18	671	2,122	0	459	0	133	592
Idaho Panhandle	4,997	27	344	1,507	6,875	0	1,835	2,946	417	5,610
Kootenai	63	0	0	0	63	0	0	0	0	0
Lolo	0	0	0	0	0	0	0	0	0	0
Nez Perce	3,302	0	420	1,381	5,103	0	398	807	10	1,215
Payette	3,491	0	0	0	3,491	0	0	1,796	0	1,796
Salmon	118	0	73	798	989	0	71	408	0	479
Sawtooth	508	0	188	0	696	0	0	0	0	0
Targhee	1,127	0	6,881	0	8,008	0	0	131	0	131
Subtotal	19,222	163	8,558	4,746	32,689	844	3,207	10,168	560	15,191
Indiana										
Wayne-Hoosier (subtotal)	0	0	312	0	312	0	327	0	0	327
Kentucky										
Daniel Boone (subtotal)	1,175	0	2,950	78	4,203	0	1,256	402	15	1,673
Louisiana										
Kisatchie (subtotal)	7,684	0	71	229	7,984	0	1,323	0	0	1,323
Maine										
White Mountain (subtotal)	14	0	168	159	341	0	342	0	0	342
Michigan										
Hiawatha	507	71	2,091	364	3,033	0	929	448	539	1,916
Huron-Manistee	897	0	1,986	1,580	4,463	0	498	73	0	571
Ottawa	456	62	2,625	3,794	6,937	0	1,068	0	0	1,068
Subtotal	1,860	133	6,702	5,738	14,433	0	2,495	521	539	3,555

See footnotes at end of table.

Table 21--Reforestation and timber stand improvement acreages certified as satisfactorily stocked by State and National Forest--fiscal year 1992--
Continued

State, Commonwealth, or Territory 1/ National Forest	Reforestation					Timber stand improvement				
	Artificial regeneration		Natural regeneration			Fertili-				
	Planted	Seeded	w/site prep. 2/	w/o site prep. 2/	Total Acres	Cleaning	Release	Thinning	zation	Pruning
Minnesota										
Chippewa	553	19	3,401	680	4,653	0	470	0	0	0
Superior	1,163	365	1,141	4,854	7,523	0	1,144	0	0	0
Subtotal	1,716	384	4,542	5,534	12,176	0	1,614	0	0	0
Mississippi										
NFs in Mississippi (subtotal)	11,404	0	1,167	0	12,571	0	5,130	2,017	510	0
Missouri										
Mark Twain (subtotal)	1,678	0	8,958	0	10,636	0	730	595	0	0
Montana										
Beaverhead	378	0	1,176	1,731	3,285	0	209	355	0	0
Bitterroot	2,522	0	133	1,153	3,808	0	222	520	0	0
Custer	0	0	0	15	15	0	380	210	0	0
Deerlodge	0	0	0	14	14	0	0	339	0	0
Flathead	892	0	39	418	1,349	0	181	2,192	0	0
Gallatin	608	0	40	653	1,301	0	0	507	0	0
Helena	1,330	0	19	560	1,909	0	18	359	0	0
Kootenai	1,820	0	756	1,358	3,934	0	168	4,588	0	0
Lewis and Clark	34	0	762	321	1,117	0	0	210	0	0
Lolo	4,774	0	1,628	1,117	7,519	0	90	907	0	0
Subtotal	12,358	0	4,553	7,340	24,251	0	1,268	10,187	0	0
New Hampshire										
White Mountain (subtotal)	40	0	1,228	1,363	2,631	0	330	0	0	0
New Mexico										
Carson	91	0	0	0	91	0	0	0	0	0
Cibola	1,023	0	0	0	1,023	0	0	0	0	0
Gila	0	0	56	414	470	0	0	0	0	0

See footnotes at end of table.

Table 21—Reforestation and timber stand improvement acreages certified as satisfactorily stocked by State and National Forest—fiscal year 1992--
Continued

State, Commonwealth, or Territory 1/ National Forest	Reforestation				Total Acres	Timber stand improvement					Total Acres	
	Artificial regeneration		Natural regeneration			Cleaning	Release	Thinning	Fertili- zation	Pruning		
	Planted	Seeded	w/site prep. 2/	w/o site prep. 2/								
New Mexico (continued)												
Lincoln	0	0	0	324	324	0	0	148	0	0	148	
Santa Fe	70	0	0	0	70	0	0	0	0	0	0	0
Subtotal	1,184	0	56	738	1,978	0	0	148	0	0	148	
North Carolina												
NFs in North Carolina (subtotal)	2,299	0	3,896	0	6,195	0	1,818	0	183	0	2,001	
Ohio												
Wayne-Hoosier (subtotal)	103	0	655	0	758	0	278	0	0	7	285	
Oklahoma												
Ouachita (subtotal)	1,727	0	99	91	1,917	0	12	0	0	0	12	
Oregon												
Deschutes	2,196	0	417	2,100	4,713	0	0	8,049	0	0	8,049	
Fremont	2,812	0	54	121	2,987	0	360	306	0	0	666	
Klamath	0	0	0	0	0	0	71	131	0	0	202	
Malheur	793	0	0	154	947	0	0	1,419	0	0	1,419	
Mt. Hood	7,914	0	0	988	8,902	0	0	3,459	5,732	62	9,253	
Ochoco	912	0	0	0	912	0	0	0	0	0	0	
Rogue River	3,866	0	0	179	4,045	0	0	43	525	0	568	
Siskiyou	5,713	0	0	8	5,721	0	1,100	1,265	2,487	64	4,916	
Siuslaw	4,377	0	0	0	4,377	0	5,454	1,330	443	20	7,247	
Umatilla	4,635	0	3,062	1,733	9,430	0	0	6,451	0	0	6,451	
Umpqua	5,630	0	0	219	5,849	0	58	1,939	3,398	0	5,395	
Wallowa-Whitman	1,066	0	700	3,304	5,070	0	1,467	1,113	0	0	2,580	
Willamette	13,758	0	0	779	14,537	0	577	2,655	6,872	722	10,826	
Winema	3,760	0	5	96	3,861	0	0	0	0	0	0	
Subtotal	57,432	0	4,238	9,681	71,351	0	9,087	28,160	19,457	868	57,572	
Pennsylvania												
Allegheny (subtotal)	0	0	670	222	892	0	0	0	0	0	0	

See footnotes at end of table.

Table 21--Reforestation and timber stand improvement acreages certified as satisfactorily stocked by State and National Forest--fiscal year 1992--
Continued

State, Commonwealth, or Territory 1/ National Forest	Reforestation				Timber stand improvement				
	Artificial regeneration		Natural regeneration		Fertili-				Total Acres
	Planted	Seeded	w/site prep. 2/	w/o site prep. 2/	Cleaning	Release	Thinning	zation	
South Carolina									
Francis Marion and Sumter (subtotal)	6,164	0	1,558	3,971	0	3,063	1,163	2,105	6,331
South Dakota									
Black Hills (subtotal)	0	0	38	17,534	0	50	13,474	0	13,524
Tennessee									
Cherokee (subtotal)	2,331	0	825	613	0	1,524	0	0	1,524
Texas									
NFs in Texas (subtotal)	6,319	0	0	606	0	259	854	0	1,113
Utah									
Ashley	0	0	0	688	0	0	1,097	0	1,097
Dixie	4,301	0	0	80	0	0	938	0	938
Manti-LaSal	0	0	0	0	0	0	850	0	850
Uinta	0	0	0	0	0	0	45	0	45
Wasatch	0	0	0	800	0	0	345	0	345
Subtotal	4,301	0	0	1,568	0	0	3,275	0	3,275
Vermont									
Green Mountain (subtotal)	0	0	259	0	0	0	0	0	0
Virginia									
George Washington Jefferson	954 322	0 0	889 1,542	0 68	0 0	334 383	0 1,340	0 0	334 1,723
Subtotal	1,276	0	2,431	68	0	717	1,340	0	2,057
Washington									
Colville	1,632	0	917	1,274	0	0	3,393	0	3,393
Gifford Pinchot	7,081	0	0	35	0	0	1,789	2,018	3,882
Idaho Panhandle	300	0	0	56	0	104	0	0	104
Mt. Baker-Snoqualmie	3,592	0	0	602	0	43	237	3,706	3,986

See footnotes at end of table.

Table 21--Reforestation and timber stand improvement acreages certified as satisfactorily stocked by State and National Forest--fiscal year 1992--
Continued

State, Commonwealth, or Territory 1/ National Forest	Reforestation				Timber stand improvement					
	Artificial regeneration		Natural regeneration		Ferti-			Acres		
	Planted	Seeded	w/site prep. 2/	w/o site prep. 2/	Cleaning	Release	Thinning	zation	Pruning	Total
Washington (continued)										
Okanogan	1,212	0	9	87	279	0	183	0	0	462
Olympic	4,561	0	0	589	0	1	788	2,891	96	3,776
Umatilla	551	0	0	0	0	80	438	0	0	518
Wenatchee	3,201	0	59	6,306	71	484	1,651	1,040	28	3,274
Subtotal	22,130	0	985	8,949	350	712	8,479	9,655	199	19,395
West Virginia										
George Washington	76	0	182	0	0	204	0	0	0	204
Monongahela	29	0	1,288	371	0	902	0	0	0	902
Subtotal	105	0	1,470	371	0	1,106	0	0	0	1,106
Wisconsin										
Chequamegon	914	30	4,214	136	0	960	0	0	0	960
Nicolet	436	0	1,439	8,550	0	788	0	0	0	788
Subtotal	1,350	30	5,653	8,686	0	1,748	0	0	0	1,748
Wyoming										
Big Horn	0	0	71	71	0	0	0	0	0	0
Black Hills	0	0	0	122	0	0	362	0	0	362
Bridger-Teton	564	0	0	0	0	0	0	0	0	0
Medicine Bow	0	0	1,549	636	0	225	729	0	0	954
Shoshone	0	0	0	1,344	0	0	0	0	0	0
Targhee	223	0	550	0	0	0	0	0	0	0
Wasatch	0	0	0	0	0	0	84	0	0	84
Subtotal	787	0	2,170	2,173	0	225	1,175	0	0	1,400
Total	226,543	3,655	67,922	98,369	1,194	102,070	105,913	35,420	2,380	246,977

1/ States not listed had no certification in fiscal year 1991.

2/ w/ site prep. = with site preparation; w/o site prep. = without site preparation.



Ponderosa pine retained during burn reforestation. Photo by Mike Ruttly

Table 22--Certification of reforestation and timber stand improvement acreages by Region--fiscal year 1992

Region	Reforestation				Timber stand improvement						
	Planted	Seeded	Natural regeneration		Total	Cleaning	Release	Precom- mercial thinning	Fertili- zation	Pruning	Total
			With site preparation	Without site preparation							
Acres											
Northern	22,453	27	5,335	10,955	38,770	0	4,064	13,940	412	560	18,976
Rocky Mountain	303	61	2,014	25,825	28,203	0	1,220	16,319	0	0	17,539
Southwest	1,440	0	108	1,607	3,155	0	0	1,354	0	0	1,354
Intermountain	14,515	136	8,326	2,755	25,732	844	515	9,904	0	0	11,263
Pacific Southwest	35,404	0	855	316	36,575	0	49,947	15,297	836	192	66,272
Pacific Northwest	79,694	0	5,223	18,574	103,491	350	9,624	36,508	29,112	1,067	76,661
Southern	65,671	2,884	15,626	7,888	92,069	0	27,746	7,075	5,060	15	39,896
Eastern	6,790	547	30,435	22,073	59,845	0	8,766	1,116	0	546	10,428
Alaska	273	0	0	8,376	8,649	0	188	4,400	0	0	4,588
Total	226,543	3,655	67,922	98,369	396,489	1,194	102,070	105,913	35,420	2,380	246,977

	Appropriated	Knutson-Vandenberg	Total
1988			
Million dollars 1/	27.1	36.3 2/	63.4
1,000 acres	199.0	138.2	337.2
Constant dollars/acre	136.2	262.7 2/	188.1 3/
1989			
Million dollars 1/	36.2	39.6	75.8
1,000 acres	196.9 4/	146.1	343.0
Constant dollars/acre	183.8	271.0	221.0 3/
1990			
Million dollars 1/	32.2	32.8	65.0
1,000 acres	200.3 5/	166.6	366.9
Constant dollars/acre	160.8	196.9	177.2 3/
1991			
Million dollars 1/	33.3	24.4	57.7
1,000 acres	226.4	167.3	393.7 6/
Constant dollars/acre	147.1	146.1	146.6 3/
1992			
Million dollars 1/	32.3	25.7	58.0
1,000 acres	171.7	181.4	353.1 7/
Constant dollars/acre	188.9	141.6	164.3 3/

1/ All dollars are constant 1992. Does not include funds for nursery and tree improvement.

2/ The cost/acre is based upon the obligated amount. The unspent funds were returned to the K-V trust fund pool for future obligation.

3/ Weighted average.

4/ Does not include 2,314 acres in Tongass Timber Supply fund.

5/ Includes 3,346 acres performed with carryover TSI funds.

6/ Does not include 2,127 acres accomplished with contributed funding.

7/ Does not include 1,746 acres accomplished with contributed funding.

Table 24—Timber stand improvement needs as of October 1, 1992, by State, forest, and cubic foot productivity class

State, Commonwealth, or Territory 1/ National Forest	All timber stand improvement Cubic foot productivity classes 2/ Acres					Total	Release subtotal	Thinning subtotal	Fertili- zation subtotal	Pruning subtotal
	0-49	50-84	85-119	120+						
Alabama										
NFs in Alabama (subtotal)	74	3,190	2,623	544		6,431	6,356	75	0	0
Alaska										
Chugach	0	0	374	0		374	0	374	0	0
Tongass-Chatham	0	104	809	10,418		11,331	0	11,331	0	0
Tongass-Ketchikan	0	0	0	32,034		32,034	448	31,586	0	0
Tongass-Stikine	30	10	455	10,693		11,188	0	11,188	0	0
Subtotal	30	114	1,638	53,145		54,927	448	54,479	0	0
Arizona										
Apache-Sitgreaves	0	360	0	0		360	0	360	0	0
Coconino	4,762	599	0	0		5,361	0	5,361	0	0
Coronado	0	0	0	0		0	0	0	0	0
Kaibab	171	31	0	0		202	0	202	0	0
Prescott	0	0	0	0		0	0	0	0	0
Tonto	68	0	0	0		68	43	25	0	0
Subtotal	5,001	990	0	0		5,991	43	5,948	0	0
Arkansas										
Ouachita	1,043	2,958	644	100		4,745	1,369	3,376	0	0
Ozark-St. Francis	204	3,929	314	70		4,517	2,198	2,319	0	0
Subtotal	1,247	6,887	958	170		9,262	3,567	5,695	0	0
California										
Angeles	46	731	359	0		1,136	962	98	0	76
Cleveland	0	707	0	0		707	511	195	0	1
Eldorado	88	611	9,512	19,481		29,692	21,938	7,696	58	0
Inyo	0	137	678	0		815	365	450	0	0
Klamath	267	16,993	23,163	15,335		55,758	40,480	15,255	23	0
Lake Tahoe Basin	800	2,486	3,021	30		6,337	3,513	2,824	0	0
Lassen	2,323	42,785	15,242	2,163		62,513	26,294	36,219	0	0
Los Padres	0	88	0	0		88	47	41	0	0
Mendocino	180	17,975	14,496	26,211		58,862	36,918	19,389	2,555	0
Modoc	84	11,824	3,713	1,201		16,822	6,385	10,361	76	0

See footnotes at end of table.

Table 24—Timber stand improvement needs as of October 1, 1992, by State, forest, and cubic foot productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	All timber stand improvement Cubic foot productivity classes 2/ Acres				Total	Release subtotal	Thinning subtotal	Ferti- li- zation subtotal	Pruning subtotal
	0-49	50-84	85-119	120+					
California (continued)									
Plumas	59	3,147	18,095	5,159	26,460	6,054	20,406	0	0
Rogue River	0	1,502	0	0	1,502	1,425	77	0	0
San Bernardino	272	2,558	126	66	3,022	1,246	1,741	0	35
Sequoia	0	2,198	2,443	8,644	13,285	10,382	2,108	672	123
Shasta	0	581	1,211	18,478	20,270	18,501	1,769	0	0
Sierra	139	1,182	5,390	9,291	16,002	12,038	3,954	10	0
Siskiyou	0	0	652	0	652	490	0	162	0
Six Rivers	0	172	8,972	19,012	28,156	19,399	8,757	0	0
Stanislaus	1,393	12,287	20,780	54,857	89,317	63,665	25,652	0	0
Tahoe	93	4,730	25,586	33,765	64,174	32,482	31,316	376	0
Toiyabe	500	0	0	0	500	0	500	0	0
Trinity	341	12,442	12,524	10,195	35,502	15,653	19,849	0	0
Subtotal	6,585	135,136	165,963	223,888	531,572	318,748	208,657	3,932	235
Colorado									
Arapaho-Roosevelt	1,907	0	0	0	1,907	274	1,633	0	0
Grand Mesa, Uncompahgre, and Gunnison	3,199	421	0	0	3,620	848	2,772	0	0
Manti-LaSal	0	0	95	0	95	0	95	0	0
Pike and San Isabel	1,865	397	0	0	2,262	1,466	796	0	0
Rio Grande	70	52	0	0	122	52	70	0	0
Routt	7,348	1,636	282	0	9,266	1,725	7,541	0	0
San Juan	1,706	1,123	49	0	2,878	2,779	99	0	0
White River	777	1,572	579	0	2,928	2,538	390	0	0
Subtotal	16,872	5,201	1,005	0	23,078	9,682	13,396	0	0
Florida									
NFs in Florida (subtotal)	804	1,422	517	41	2,784	465	392	1,927	0
Georgia									
Chattahoochee and Oconee (subtotal)	0	1,191	5,820	3,013	10,024	2,678	6,246	1,100	0

See footnotes at end of table.

Table 24—Timber stand improvement needs as of October 1, 1992, by State, forest, and cubic foot productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	All timber stand improvement				Total	Release subtotal	Thinning subtotal	Ferti- zation subtotal	Pruning subtotal
	Cubic foot productivity classes 2/ Acres								
	0-49	50-84	85-119	120+					
Idaho									
Boise	678	1,714	4,482	703	7,577	1,675	5,902	0	0
Caribou	0	574	47	0	621	485	136	0	0
Challis	0	273	0	0	273	78	195	0	0
Clearwater	2,173	29	775	2,520	5,497	1,347	4,036	0	114
Idaho Panhandle	6,619	2,766	11,761	8,075	29,221	5,394	22,237	1,590	0
Kootenai	57	0	182	93	332	0	332	0	0
Nez Perce	291	1,865	2,715	888	5,759	696	5,033	30	0
Payette	408	1,154	5,449	448	7,459	1,242	6,217	0	0
Salmon	8,100	1,008	0	0	9,108	5,817	3,291	0	0
Sawtooth	396	24	0	0	420	152	268	0	0
Targhee	5	2,818	0	0	2,823	865	1,958	0	0
Subtotal	18,727	12,225	25,411	12,727	69,090	17,751	49,605	1,620	114
Illinois									
Shawnee (subtotal)	0	50	4	0	54	1	0	0	53
Indiana									
Hoosier (subtotal)	0	0	924	4,049	4,973	1,560	1,385	0	2,028
Kentucky									
Daniel Boone (subtotal)	3	1,060	4,885	586	6,534	1,026	5,454	3	51
Louisiana									
Kisatchie (subtotal)	3	243	1,393	500	2,139	1,097	1,042	0	0
Maine									
White Mountain (subtotal)	6	36	46	13	101	42	59	0	0
Michigan									
Hiawatha	1,564	6,630	1,517	53	9,764	3,750	1,818	0	4,196
Huron-Manistee	1,136	2,375	486	0	3,997	2,174	1,762	0	61
Ottawa	203	2,189	155	0	2,547	2,547	0	0	0
Subtotal	2,903	11,194	2,158	53	16,308	8,471	3,580	0	4,257

See footnotes at end of table.

Table 24—Timber stand improvement needs as of October 1, 1992, by State, forest, and cubic foot productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	All timber stand improvement Cubic foot productivity classes 2/ Acres				Total	Release subtotal	Thinning subtotal	Ferti- li- zation subtotal	Pruning subtotal
	0-49	50-84	85-119	120+					
Minnesota									
Chippewa	0	59	1,272	43	1,374	950	0	0	424
Superior	3,694	0	0	38	3,732	3,732	0	0	0
Subtotal	3,694	59	1,272	81	5,106	4,682	0	0	424
Mississippi									
NFs in Mississippi (subtotal)	585	641	1,244	3,892	6,362	4,117	1,944	301	0
Missouri									
Mark Twain (subtotal)	0	10,534	221	0	10,755	1,982	8,688	0	85
Montana									
Beaverhead	3,583	1,971	470	76	6,100	372	5,728	0	0
Bitterroot	1,246	543	276	70	2,135	420	1,715	0	0
Custer	1,636	5	25	0	1,666	708	958	0	0
Deerlodge	5,966	1,157	343	0	7,466	1,110	6,356	0	0
Flathead	2,617	3,266	8,646	3,130	17,659	803	16,809	29	18
Gallatin	415	742	206	272	1,635	159	1,476	0	0
Helena	2,251	416	485	0	3,152	270	2,872	10	0
Idaho Panhandle	10	0	118	48	176	10	166	0	0
Kootenai	3,634	7,925	21,974	7,029	40,562	1,367	39,084	0	111
Lewis and Clark	795	1,221	999	0	3,015	37	2,978	0	0
Lolo	1,387	3,973	4,094	599	10,053	123	9,923	0	7
Subtotal	23,540	21,219	37,636	11,224	93,619	5,379	88,065	39	136
New Hampshire									
White Mountain (subtotal)	111	121	125	24	381	74	307	0	0
New Mexico									
Carson	310	40	0	0	350	235	115	0	0
Cibola	0	0	0	0	0	0	0	0	0
Gila	3,792	892	0	0	4,684	0	1,075	0	0
Lincoln	54	1,019	2	0	1,075	688	3,947	0	0
Santa Fe	4,304	331	0	0	4,635	20	4,664	0	0
Subtotal	8,460	2,282	2	0	10,744	943	9,801	0	0

See footnotes at end of table.

Table 24—Timber stand improvement needs as of October 1, 1992, by State, forest, and cubic foot productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	All timber stand improvement Cubic foot productivity classes 2/ Acres					Total	Release subtotal	Thinning subtotal	Fertili- zation subtotal	Pruning subtotal
	0-49	50-84	85-119	120+						
New York										
Green Mountain (subtotal)	0	111	719	0		830	60	770	0	0
North Carolina										
NFs in North Carolina (subtotal)	741	3,279	1,124	3,580		8,724	6,013	1,607	1,104	0
Ohio										
Wayne (subtotal)	26	441	655	2,508		3,630	1,031	1,261	0	1,338
Oklahoma										
Ouachita (subtotal)	0	581	204	211		996	513	483	0	0
Oregon										
Deschutes	5,136	5,339	750	45		11,270	732	10,538	0	0
Fremont	12,968	7,822	963	79		21,832	4,220	17,612	0	0
Klamath	12	326	674	909		1,921	1,086	835	0	0
Malheur	8,648	16,503	0	0		25,151	568	24,583	0	0
Mt. Hood	308	25,794	21,471	3,894		51,467	618	23,576	22,143	5,130
Ochoco	5,416	4,196	12	0		9,624	170	8,743	0	711
Rogue River	0	8,794	29,354	2,044		40,192	28,622	6,654	4,870	46
Siskiyou	0	1,904	21,839	4,053		27,796	14,958	11,193	1,509	136
Siuslaw	0	0	0	11,570		11,570	4,644	5,994	633	299
Umatilla	2,140	2,793	201	0		5,134	148	4,935	0	51
Umpqua	0	6,577	22,941	6,497		36,015	4,193	18,513	12,942	367
Wallowa-Whitman	945	8,163	1,193	0		10,301	2,591	7,560	0	150
Willamette	0	1,506	18,792	24,115		44,413	4,356	15,060	19,470	5,527
Winema	18,713	19,148	353	311		38,525	826	37,484	0	215
Subtotal	54,286	108,865	118,543	53,517		335,211	67,732	193,280	61,567	12,632
Puerto Rico										
Caribbean (subtotal)	0	300	1,100	0		1,400	800	600	0	0
South Carolina										
Francis Marion & Sumter (subtotal)	0	37	5,158	2,325		7,520	3,506	1,804	2,210	0

See footnotes at end of table.

Table 24--Timber stand improvement needs as of October 1, 1992, by State, forest, and cubic foot productivity class--Continued

State, Commonwealth, or Territory 1/ National Forest	All timber stand improvement Cubic foot productivity classes 2/ Acres				Total	Release subtotal	Thinning subtotal	Ferti- zation subtotal	Pruning subtotal
	0-49	50-84	85-119	120+					
South Dakota									
Black Hills	7,897	665	0	0	8,562	0	8,562	0	0
Custer	0	0	0	0	0	0	0	0	0
Subtotal	7,897	665	0	0	8,562	0	8,562	0	0
Tennessee									
Cherokee (subtotal)	38	1,913	546	2,374	4,871	4,020	851	0	0
Texas									
NFs in Texas (subtotal)	0	869	2,027	1,575	4,471	3,766	705	0	0
Utah									
Ashley	750	0	0	0	750	0	750	0	0
Dixie	641	5,411	0	0	6,052	680	5,372	0	0
Fishlake	58	329	0	0	387	152	235	0	0
Manti-LaSal	0	0	1,331	200	1,531	0	1,531	0	0
Uinta	0	0	45	0	45	45	0	0	0
Wasatch-Cache	916	305	0	0	1,221	146	1,075	0	0
Subtotal	2,365	6,045	1,376	200	9,986	1,023	8,963	0	0
Vermont									
Green Mountain (subtotal)	921	1,524	109	0	2,554	1,289	1,265	0	0
Virginia									
George Washington	140	393	60	939	1,532	1,492	40	0	0
Jefferson	18	2,363	245	554	3,180	983	2,087	0	110
Subtotal	158	2,756	305	1,493	4,712	2,475	2,127	0	110
Washington									
Colville	845	3,884	2,819	0	7,548	1,682	5,866	0	0
Gifford Pinchot	0	17,530	9,867	6,532	33,929	412	23,886	8,132	1,499

See footnotes at end of table

Table 24--Timber stand improvement needs as of October 1, 1992, by State, forest, and cubic foot productivity class--Continued

State, Commonwealth, or Territory 1/	All timber stand improvement Cubic foot productivity classes 2/				Total	Release subtotal	Thinning subtotal	Fertili- zation subtotal	Pruning subtotal
	0-49	50-84	85-119	120+					
National Forest				Acres					
Washington (continued)									
Idaho Panhandle	130	0	752	427	1,309	197	1,112	0	0
Mt. Baker-Snoqualmie	0	120	3,507	2,456	6,083	90	4,393	1,488	112
Okanogan	2,006	3,828	849	0	6,683	2,390	3,558	0	735
Olympic	77	1,109	8,915	2,138	12,239	29	8,953	2,806	451
Umatilla	1,638	2,587	0	0	4,225	100	4,083	0	42
Wenatchee	0	18,779	4,080	204	23,063	4,549	13,508	3,804	1,202
Subtotal	4,696	47,837	30,789	11,757	95,079	9,449	65,359	16,230	4,041
West Virginia									
George Washington	0	217	0	195	412	412	0	0	0
Monongahela	14	233	813	435	1,495	909	586	0	0
Subtotal	14	450	813	630	1,907	1,321	586	0	0
Wisconsin									
Chequamegon	0	306	672	0	978	933	45	0	0
Nicolet	154	825	280	32	1,291	591	120	0	580
Subtotal	154	1,131	952	32	2,269	1,524	165	0	580
Wyoming									
Bighorn	12,347	314	0	0	12,661	1,526	11,135	0	0
Black Hills	921	209	0	0	1,130	0	1,130	0	0
Bridger-Teton	130	322	927	0	1,379	0	1,379	0	0
Medicine Bow	6,367	320	0	0	6,687	432	6,255	0	0
Shoshone	160	0	0	0	160	97	63	0	0
Targhee	0	0	0	0	0	0	0	0	0
Wasatch	0	0	0	0	0	0	0	0	0
Subtotal	19,925	1,165	927	0	22,017	2,055	19,962	0	0
Total	179,866	391,764	419,192	394,152	1,384,974	495,689	773,168	90,033	26,084

1/ States not listed had no timber stand improvement needs as of October 1, 1992.

2/ Cubic foot productivity class refers to the cubic feet of wood produced per acre per year in a natural unmanaged stand.

Table 25--Timber stand improvement program needs--fiscal years 1992-94

	Work needs	Annual program, appropriated funds 1/	
	1,000 acres	1,000 acres	Million dollars
10/1/91 balance	1,307		
Fiscal year 1992:			
New needs	433		
Accomplishments	-355	171.7	32.3
10/1/92 balance	1,385		
Fiscal year 1993:			
Projected new needs	400		
Projected accomplishments	-300	109.2	27.5
Projected 10/1/93 balance	1,485		
Fiscal year 1994:			
Projected new needs	400		
Projected accomplishments	-300		
Projected 10/1/94 balance	1,585	2/	

1/ Includes Reforestation Trust Fund pursuant to P.L. 96-451, as amended.

2/ This represents over 5 years of future accomplishments.

Table 26—Timber offered, sold, unsold and harvested--fiscal years 1988-92

	1992	1991	1990	1989	1988
Offered					
Volume (billion board feet)	5.1	6.2	11.1	10.5	11.3
Volume (billion cubic feet) 1/	(1.0)	(1.2)			
Sold					
Number of sales 2/	250,852	271,963	262,781	275,895	251,557
Volume (billion board feet)	4.4	6.4	9.3	8.4	11.0
Volume (billion cubic feet)	(0.86)	(1.2)			
Value (million dollars) 3/	576.2	801.2	1,609.9	1,077.5	1,254.4
Difference 4/					
Volume (billion board feet)	-0.7	-0.2	1.8	2.1	0.3
Volume (billion cubic feet)	(-0.14)	(-0.04)			
Harvested					
Volume (billion board feet)	7.3	8.5	10.5	12.0	12.6
Volume (billion cubic feet)	(1.4)	(1.6)			
Value (million dollars) 5/	934.5	1,008.6	1,187.6	1,309.7	1,235.7

1/ Conversion from the 1990 RPA Program.

2/ These figures do not include nonconvertible product sales (see table 29 for number of nonconvertible product sales per year).

3/ This is the high bid value from all sales sold and includes stumpage, cost of reforestation, stand improvement costs, and timber salvage. Does not include value of roads or brush disposal.

4/ Difference between total volume offered and sold.

5/ This is the current stumpage rate for the actual volume harvested and includes the reforestation and stand improvement costs and timber salvage. Does not include value of roads or brush disposal.

Table 27—Timber offered, sold, unsold, and harvested by Region—fiscal years 1991-92

	1992				1991			
	Offered 1/	Sold 2/	Difference 3/	Harvested 4/	Offered 1/	Sold 2/	Difference	Harvested 4/
	<i>Million board feet</i>							
Northern	509.3	592.6	-83.3	807.6	838.5	672.5	166.0	799.5
Rocky Mountain	338.5	270.1	68.4	345.1	329.6	291.0	38.6	400.6
Southwestern	182.7	162.8	19.9	291.7	279.5	282.2	-2.7	344.1
Intermountain	317.2	315.5	1.7	366.3	338.8	282.7	56.1	360.0
Pacific Southwest	784.0	574.0	210.0	1,150.8	1,022.9	881.2	141.7	1,313.3
Pacific Northwest	683.9	740.5	-56.6	2,140.1	1,093.9	2,105.8	-1,011.9	3,166.5
Southern	1,108.4	1,008.8	99.6	1,065.2	1,129.4	1,045.1	84.3	1,029.9
Eastern	713.5	711.0	2.5	750.7	791.5	781.2	10.3	696.4
Alaska	425.3	83.2	342.1	372.1	356.0	52.9	303.1	364.6
Total	5,062.7	4,458.5	604.3	7,289.6	6,180.1	6,394.6	-214.5	8,474.9

1/ Sales offered for the fiscal year being displayed.

2/ Includes sales offered in prior fiscal years and sold in the fiscal year being displayed and miscellaneous small sales that were previously offered and/or sold and were reoffered and sold in the fiscal year being displayed. Does not include the volume of long-term sales released for harvesting.

3/ These were the timber sales that were offered but withdrawn (23.5 MMBF); offered but not opened until after 9/30/91 (445.3 MMBF); and no bid sales (142.2 MMBF). In addition, there were 702.7 MMBF of sale volume carried from FY 1991 that sold in FY 1992.

4/ Includes the volume harvested on long-term sales.

5/ Includes long-term sales volume prepared in the offered column of 384.5 MMBF.

6/ Columns may not add due to rounding.

Table 28—Timber sold and harvested by State--fiscal year 1992 1/

State or Commonwealth 3/	Timber sold			Timber harvested 2/	
	Sales	Volume MBF 5/	Bid value 4/ Actual dollars	Volume MBF 5/	Receipts 4/ Actual dollars
Alabama	887	65,494	4,567,149	103,810	6,813,532
Alaska	85	83,155	2,067,108	372,143	-13,844,910 6/
Arizona	18,349	121,345	11,622,377	218,441	19,597,478
Arkansas	2,181	162,183	16,080,829	95,812	9,442,171
California	47,618	574,396	105,665,396	1,154,703	191,588,589
Colorado	32,944	120,500	6,851,695	159,205	4,840,253
Florida	166	71,404	4,283,600	75,747	4,916,965
Georgia	1,159	54,057	4,742,316	57,755	4,371,029
Idaho	24,421	436,491	55,651,976	705,647	64,438,465
Illinois	70	5,705	87,326	4,187	84,141
Indiana	22	96	2,268	165	1,380
Kentucky	923	41,835	2,363,453	38,293	1,656,330
Louisiana	1,236	96,824	9,143,396	142,680	13,110,014
Maine	12	43	3,443	70	4,708
Michigan	724	212,923	6,115,190	202,856	5,618,564
Minnesota	253	156,369	4,768,465	175,861	3,828,420
Mississippi	1,474	213,181	23,418,004	206,417	20,961,506
Missouri	1,412	62,612	3,427,142	53,574	2,841,902
Montana	13,909	401,676	59,723,154	372,309	38,020,594
Nebraska	11	25	1,274	970	25,617
Nevada	1,771	2,649	210,953	2,272	49,257
New Hampshire	198	18,710	623,208	23,175	933,291
New Mexico	15,502	41,441	2,300,610	73,296	3,399,167
New York	9	17	330	18	360
North Carolina	1,542	47,688	2,175,157	69,717	1,927,262
North Dakota	34	45	545	50	595
Ohio	149	3,668	170,503	5,339	397,590
Oklahoma	82	9,243	557,037	13,490	846,502
Oregon	37,380	614,901	146,283,666	1,611,459	388,869,889
Pennsylvania	123	71,464	20,595,674	80,224	18,305,054
South Carolina	230	73,395	5,527,564	72,082	6,338,512
South Dakota	2,458	110,395	20,724,115	118,083	11,453,915
Tennessee	550	26,626	1,415,623	31,535	1,327,257
Texas	1,074	91,958	14,150,660	100,611	12,726,146
Utah	13,005	43,872	1,884,185	58,831	1,884,491
Vermont	55	6,889	481,861	9,852	345,713
Virginia	3,340	52,265	1,851,983	53,530	1,381,349
Washington	9,942	126,297	19,923,612	544,160	96,191,221
West Virginia	581	39,424	6,571,823	40,276	2,749,475
Wisconsin	238	135,695	3,493,717	158,800	3,321,732
Wyoming	14,733	61,496	6,710,051	82,190	3,738,661
Total 7/	250,852	4,458,452	576,238,437	7,289,632	934,504,178

1/ Excludes nonconvertible products such as Christmas trees, cones, burls, etc.

2/ Preliminary.

3/ States not listed had no timber sold or harvested in fiscal year 1992.

4/ Includes Knutson-Vandenberg and salvage sale receipts. Does not include brush disposal and road costs.

5/ MBF = thousand board feet.

6/ The result of refunds for overpayments due to a rate redetermination for the period of 1989 to 1991 on a long-term contract.

7/ Columns may not add due to rounding.

Table 29--Number of sales, volume, and value of timber sold on National Forest lands by size class--fiscal years 1988-92

		Sale size class						Noncon- vertibles	2/ convertibles	Total less non- convertibles	3/
		To 300	301- 2,000	\$2,001- 2,000 MBF1/	2,001- 5,000 MBF	5,001- 15,000 MBF	15,001 MBF and over				
1988											
	Number of sales	233,567	13,791	2,806	701	652	40	249,784	251,557		
	Volume (MBF)	550,589	242,616	1,514,723	2,304,845	5,562,653	792,807	0	10,968,233		
	Value (\$1,000)	3,944.0	4,691.7	114,447.7	252,343.8	791,130.5	87,829.9	2,401.5	1,254,387.6		
1989											
	Number of sales	253,542	18,392	2,849	615	462	35	250,081	275,895		
	Volume (MBF)	555,149	276,650	1,612,985	1,947,180	3,510,835	511,786	0	8,414,585		
	Value (\$1,000)	4,244	6,830	130,713	225,523	629,542	80,683	2,864	1,077,534		
1990											
	Number of sales	247,078	11,258	3,274	645	503	23	253,981	262,781		
	Volume (MBF)	491,767	239,889	1,799,519	2,154,272	4,137,737	426,510	0	9,249,695		
	Value (\$1,000)	4,190	6,841	179,729	361,163	980,264	77,737	2,882	1,609,925		
1991											
	Number of sales	255,653	12,451	2,976	524	325	34	239,165	271,963		
	Volume (MBF)	461,276	237,284	1,473,391	1,599,520	2,319,924	303,057	0	6,394,452		
	Value (\$1,000)	4,455	4,926	122,843	194,426	433,999	40,588	2,747	801,237		
1992											
	Number of sales	231,038	15,840	3,361	448	162	3	218,851	250,852		
	Volume (MBF)	410,377	195,702	1,448,513	1,288,949	1,033,838	81,073	0	4,458,452		
	Value (\$1,000)	4,058	5,170	160,044	207,443	190,718	6,382	2,423	576,238		

1/ MBF = thousand board feet.

2/ Nonconvertible products include Christmas trees, cones, burls, etc.

3/ May not add due to rounding.

Table 30--Uncut timber volume under contract by Region--fiscal years 1988-92

Region	1992		1991		1990		1989		1988
	MMBF ^{1/}	MMCF 2/	MMBF ^{1/}	MMCF 2/	MMBF ^{1/}	MMCF 2/	Million board feet	Million board feet	
Northern	1,319	322	1,599	391	1,839		2,210		2,382
Rocky Mountain	683	157	763	175	908		912		1,036
Southwestern	199	33	334	56	434		606		768
Intermountain	503	102	550	112	639		612		620
Pacific Southwest	964	150	1,411	219	2,240		2,650		3,275
Pacific Northwest	3,358	658	4,909	963	8,029		7,112		9,959
Southern	1,251	233	1,308	244	1,354		1,673		1,543
Eastern	1,706	277	1,746	283	1,712		1,732		1,778
Alaska	95	24	185	47	269		377		417
Total	10,078	1,956	12,805	2,490	17,424		17,884		21,778

1/ Volume in local scale. Long-term sales not included. Long-term sales volume under contract at the end of fiscal year 1992 was 4,477 million board feet and 4,771 million board feet in 1991.

2/ Million cubic feet conversions based on 1990 RPA Program.

	1992	1991	1990
	<i>1,000 dollars</i>		
National Forest System			
Timber management.....	188,604	197,403	185,561
Harvest administration.....	75,141	65,730	66,235
Subtotal.....	263,745	263,133	251,796
Support to timber sales program			
Minerals.....	1,606	1,428	1,389
Forest fire protection.....	4,376	3,651	4,063
Recreation.....	15,827	12,102	12,406
Wildlife and fish.....	15,920	10,942	9,700
Range.....	1,243	1,151	989
Soil and water.....	9,804	7,538	9,057
Landline location.....	2/	19,851	18,355
Subtotal.....	48,776	56,663	55,959
Road construction			
Forest Service construction.....	117,574	119,088	93,030
Purchaser construction.....	(113,000)	(110,000)	(120,310)
Purchaser construction by the Forest Service.....	5,806	4,859	2,946
Subtotal.....	123,380	123,947	95,976
Total, appropriated accounts.....	435,901	443,743	403,731
Special accounts 3/			
Timber salvage sales.....	120,358	117,620	111,006
Tongass timber supply fund 4/.....	-	-	36,955
Subtotal.....	120,358	117,620	147,961
Total	556,259	561,363	551,692

1/ Timber sale preparation and offer costs displayed are the actual appropriated funds for FY 1990-92. Costs displayed in TSPIRS tables 32-34 are the accrued costs for the FY 1992 timber program.

2/ All landline funds were spent in support of the stewardship program and resolving trespass cases.

3/ Includes General Administration expenses.

4/ Included in appropriated accounts.

Table 32—Statement of timber sale revenues and expenses--fiscal year 1992 1/

Account activity	Totals 2/
	<i>1,000 dollars</i>
Revenues	
Timber sales.....	934,010
Purchaser road credits established.....	83,647
Associated charges.....	56,600
Interest and penalties.....	<u>2,343</u>
Total revenues.....	1,076,600
Direct expenses	
Timber sale expenses.....	569,216
Timber program expenses.....	<u>105,411</u>
Total direct expenses.....	674,627
Indirect expenses	
Timber sale expenses.....	4,311
Timber program expenses.....	<u>52,167</u>
Total indirect expenses.....	56,478
Total expenses.....	731,105
Revenue before extraordinary losses.....	345,485
Extraordinary losses.....	<u>90,838</u>
Net revenue.....	<u>254,657</u>
Payment to states.....	305,478
Volume harvested (BBF)	7.3

1/ Source data from Statement of Revenues and Expenses of Timber Sale Program Information Reporting System (TSPIRS). TSPIRS is an accounting report which allocates capital expenditures, such as costs for roads, facilities, and investments in roads, differently from that in the funding report, as represented in table 31. For this reason, the various cost and expenditure data in the two tables are not directly comparable.

2/ These are national totals for 1992. The Timber Sale Program Annual Report, with Forest and State level information, will be available in the spring of 1993.

	Units	Totals
Employment and income		
Timber-related employment (jobs).....	Jobs	93,636
Employment-related income (M\$).....	1,000 dollars	\$4,195,712
Federal income taxes generated (M\$).....	1,000 dollars	\$634,234
Related timber information		
Timber		
Offered.....	MMBF 2/	5,063 3/
Sold and awarded.....	MMBF	4,458 3/
Harvested		
Sawtimber.....	MMBF	5,270
Roundwood.....	MMBF	1,286
Firewood.....	MMBF	379
Other.....	MMBF	355
Total harvested.....		<u>7,290</u>
Total acres harvested	Acres	<u>853,146</u>
Firewood		
Free use.....	MMBF	<u>245</u>
Nonconvertible products		
Christmas trees cut.....	Trees	340,350
Other products removed (M\$).....	1,000 dollars	<u>\$1,507</u>
Regeneration acres treated	Acres	450,004
Timber stand improvement treatments	Acres	<u>354,745</u>
Forest road program (in support of the timber program)		
Construction		
Appropriated.....	Miles	73
Purchaser credit.....	Miles	1,084
Total construction.....	Miles	<u>1,157</u>
Reconstruction		
Appropriated.....	Miles	223
Purchaser credit.....	Miles	2,480
Total reconstruction.....	Miles	<u>2,703</u>

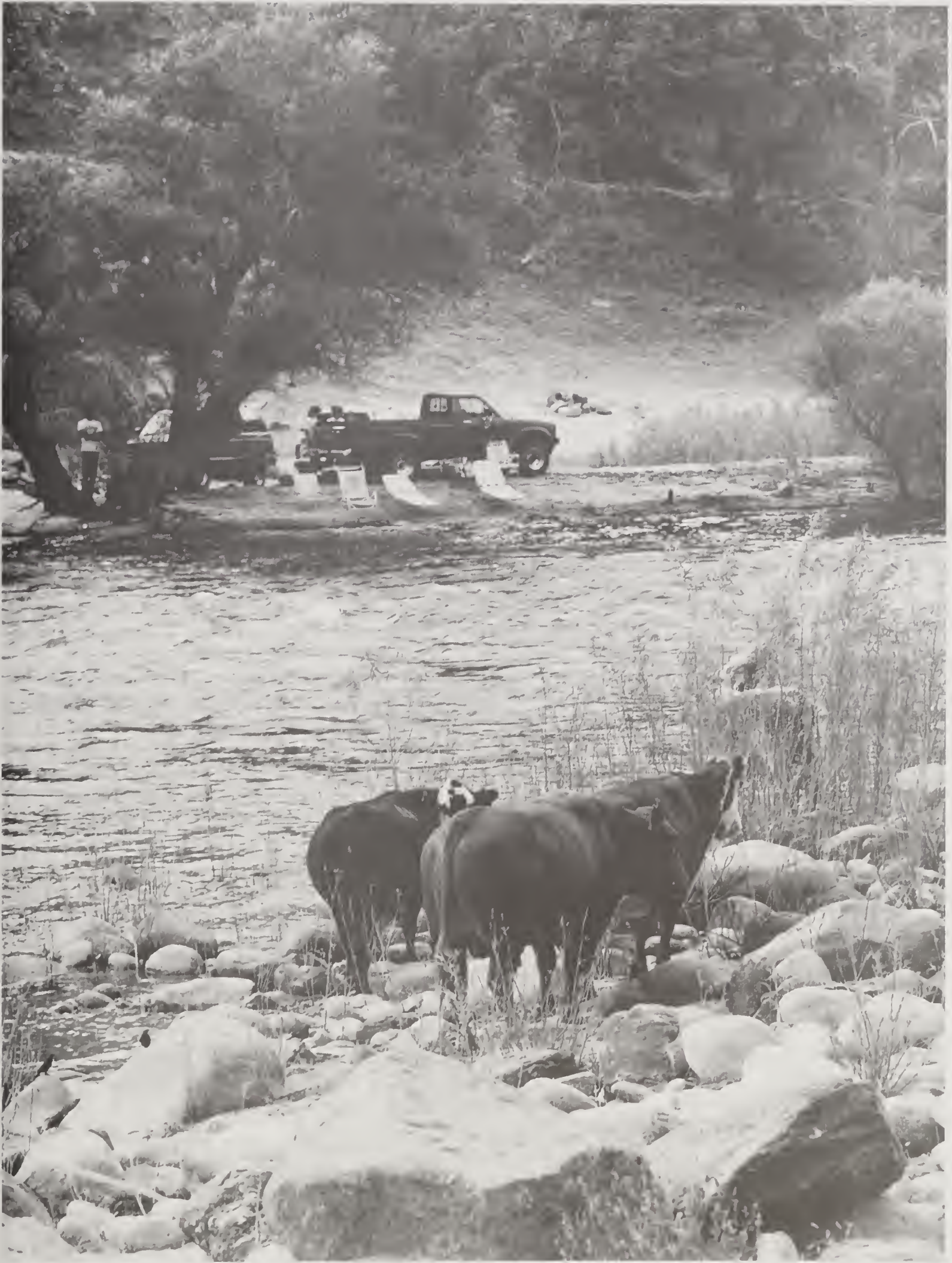
1/ These are national totals for 1992. The Timber Sale Program Annual Report, with Forest and State level information, will be available in the spring of 1993.

2/ MMBF = million board feet.

3/ Does not include volume released from long-term timber sales; TSPIRS reports do include this volume.

	Totals
	1,000 dollars
Present value of benefits	
Positive effects	
Timber.....	1,422,368
Recreation.....	24,168
Wildlife.....	41,789
Fisheries.....	965
Grazing.....	3,798
Soils.....	163
Water.....	51,272
Total	1,544,523
Negative effects	
Timber.....	5
Recreation.....	209
Wildlife.....	5,377
Fisheries.....	575
Grazing.....	0
Soils.....	175
Water.....	13
Total	6,354
Total present benefits (positive less negative)	1,538,169
Present value of costs	
Timber.....	576,785
Recreation.....	4,100
Wildlife.....	7,322
Fisheries.....	997
Grazing.....	1,529
Soils.....	113
Water.....	678
Roads.....	188,449
Total	779,973
Present net value for timber only	657,129
Present net value	758,196

1/ These are national totals for 1992. The Timber Sale Program Annual Report, with Forest and State level information, will be available in the spring of 1993.



FS Photo

Table 35—Status of NFS acres within grazing allotments with range vegetation management objectives--fiscal year 1992

Region	Acres with range vegetation management objectives	Acres meeting or moving toward FP objectives 1/	Acres not meeting or moving toward FP objectives 1/	Acres of undetermined status	Acres monitored in FY 1992
Northern	4,773,665	1,824,643	2,949,022	0	528,543
Rocky Mountain	12,495,417	7,974,701	1,102,496	3,418,220	3,990,726
Southwest	18,633,373	11,384,125	5,166,937	2,082,311	5,341,988
Intermountain	21,334,083	15,942,344	1,375,619	4,016,120	8,065,155
Pacific Southwest	6,608,129	2,610,423	146,845	3,850,861	1,772,415
Pacific Northwest	10,067,609	4,994,108	517,300	4,556,201	2,533,713
Southern	1,509,158	1,440,521	68,343	294	357,075
Eastern	64,504	58,262	3,879	2,363	57,476
Total	75,485,938	46,229,127	11,330,441	17,926,370	22,647,091

See footnote at end of table.

Table 35—Status of NFS acres within grazing allotments with range vegetation management objectives--fiscal year 1992--Continued

Region	Total riparian acres	Riparian acres meeting or moving toward FP objectives 1/	Riparian acres not meeting or moving toward FP objectives 1/	Riparian acres of undetermined status	Riparian acres monitored in FY 1992
Northern	167,268	65,255	102,013	0	16,812
Rocky Mountain	457,932	287,824	40,293	129,815	101,864
Southwest	299,176	186,473	94,198	18,505	71,394
Intermountain	639,676	481,522	83,762	74,392	254,696
Pacific Southwest	291,900	143,510	14,084	134,306	69,764
Pacific Northwest	399,043	175,898	78,529	144,616	98,302
Southern	37,010	35,322	31	1,657	5,862
Eastern	1,420	692	657	71	963
Total	2,293,425	1,376,496	413,567	503,362	619,657

1/ FP = forest plan.

Table 36--Range allotment management status by Region--fiscal year 1992

Region	Total number of allotments	Number of allotments being managed to achieve forest plan objective
Northern	1,666	603
Rocky Mountain	2,409	1,726
Southwestern	1,431	904
Intermountain	1,854	1,293
Pacific Southwest	760	358
Pacific Northwest	736	324
Southern	613	596
Eastern	165	141
Total	9,634	5,945

Table 37--Actual grazing use in AUM's by State--fiscal year 1992 1/

State, Commonwealth, or Territory 2/	Cattle	Sheep	Domestic horses	Wild horses	Wild burros	Total
Alabama	2,580	0	96	0	0	2,676
Arizona	1,038,553	12,917	6,617	528	0	1,058,615
Arkansas	9,312	24	0	0	0	9,336
California	367,714	32,421	10,223	7,972	1,224	419,554
Colorado	751,397	134,406	15,687	0	0	901,490
Florida	19,771	0	0	0	0	19,771
Georgia	3,854	0	0	0	0	3,854
Idaho	584,007	182,203	14,444	0	0	780,654
Illinois	17,342	743	58	0	0	18,143
Kansas	39,765	0	0	0	0	39,765
Kentucky	366	0	0	0	0	366
Louisiana	14,195	0	0	0	0	14,195
Michigan	1,076	0	0	0	0	1,076
Minnesota	194	0	0	0	0	194
Mississippi	111	0	0	0	0	111
Missouri	30,196	0	0	0	0	30,196
Montana	495,106	15,805	19,311	350	0	530,572
Nebraska	116,506	0	10	0	0	116,516
Nevada	207,898	50,598	1,389	14,852	0	274,737
New Mexico	752,376	28,512	6,834	2,040	0	789,762
New York	8,203	0	317	0	0	8,520
North Dakota	399,428	27	2,909	0	0	402,364
Ohio	1,073	0	7	0	0	1,080
Oklahoma	25,421	0	14	0	0	25,435
Oregon	415,911	29,426	5,590	1,944	0	452,871
South Dakota	395,284	5,507	229	0	0	401,020
Texas	71,720	0	0	0	0	71,720
Utah	401,939	172,693	3,747	1,420	0	579,799
Vermont	188	0	0	0	0	188
Virginia	7,257	0	1,005	0	0	8,262
Washington	99,334	13,215	1,903	0	0	114,452
West Virginia	6,863	189	22	0	0	7,074
Wyoming	498,930	125,870	9,173	0	0	633,973
Total	6,783,870	804,556	99,585	29,106	1,224	7,718,341

1/ An animal unit month (AUM) is the amount of forage required by a 1,000-pound cow, or the equivalent for 1 month.

2/ States not listed had no Forest Service grazing program in 1992.

Table 38--Annual grazing statistics--fiscal year 1992

	Permittees	Cattle		Horses and burros		Sheep and goats		Total
		Number	AUM's 1/	Number	AUM's	Number	AUM's	
Permitted to graze		1,363,489	8,310,805	44,235	100,098	1,183,923	948,249	9,359,152
Actually grazed: Paid permits	9,940	1,200,723	6,752,018	15,307	48,731	1,016,565	796,955	7,597,704
Free use:								
Recreation stock	6,695	12	32	30,882	38,624			38,656
Other free use	186	9,786	24,343	1,300	11,874	8,438	7,015	43,232
Private land permits 3/	177	43,024	356,415	305	4,796	14,410	13,301	374,512
Crossing	5	1,803	508	208	125	3,167	486	1,119
Unauthorized use	42	1,439	6,969	25	231	880	100	7,300
Subtotal 3/	16,868	1,213,763	6,783,870	47,722	99,585	1,029,050	804,556	7,688,011
Wild horses				2,928	29,106			29,106
Wild burros				145	1,224			1,224
Total actually grazed 3/	16,868	1,213,763	6,783,870	50,795	129,915	1,029,050	804,556	7,718,341

1/ An animal unit month (AUM) is the amount of forage required by a 1,000-pound cow, or the equivalent for 1 month.

2/ Includes term and temporary grazing permits and all other paid permits (e.g., transportation, research, working animals, special uses, etc.).

3/ Private land permit data not included in totals.

Region	Cases	
	Planned	Accomplished
Northern	3,920	4,572
Rocky Mountain	1,429	1,401
Southwestern	2,207	2,436
Intermountain	4,169	3,581
Pacific Southwest	3,029	3,449
Pacific Northwest	2,723	3,262
Southern	4,298	4,146
Eastern	2,604	2,576
Alaska	1,108	1,108
Total	25,487	26,531

Table 40--Energy mineral workload and production--fiscal years 1988-92

Fiscal year	Acres under lease	Oil production 1/	Gas production 1/	Coal production 1/
	<i>Millions</i>	<i>Barrels</i>	<i>1,000 cu. ft.</i>	<i>Short tons</i>
1988	17.8	13,300,000	191,000,000	41,200,000
1989	14.2	12,100,000	204,000,000	65,500,000
1990	12.0	11,800,000	210,000,000	75,000,000
1991	12.0	11,550,000	201,000,000	85,600,000
1992	9.0	11,000,000	210,000,000	85,000,000

1/ Estimates.

Table 41—Road and bridge construction and reconstruction by State--fiscal year 1992

State or Commonwealth 2/	From Appropriated Funds 1/							
	Construction				Reconstruction			
	Roads		Bridges		Roads		Bridges	
	Miles	Cost	No.	Cost	Miles	Cost	No.	Cost
	1,000 dollars			1,000 dollars	1,000 dollars			1,000 dollars
Alabama	0.0	48.7	0	0.0	0.0	637.5	0	0.0
Alaska 4/	10.9	12,845.9	1	711.8	4.3	2,112.7	24	1,223.1
Arizona	4.7	3,075.7	0	0.0	31.8	3,639.5	0	0.0
Arkansas	0.0	606.3	1	190.6	1.9	1,570.1	0	0.0
California	3.0	8,343.7	4	137.0	33.8	8,578.4	5	431.6
Colorado	3.1	2,071.6	1	230.5	56.3	6,362.0	2	89.9
Florida	0.0	0.0	0	0.0	0.2	695.1	0	0.0
Georgia	1.0	634.1	0	0.0	29.2	2,718.2	0	0.0
Idaho	12.1	5,355.4	0	0.0	122.2	15,441.5	5	400.3
Illinois	0.0	0.0	0	0.0	11.0	1,070.2	3	304.3
Indiana	0.0	0.0	0	0.0	3.8	765.9	0	0.0
Kansas	0.2	11.8	0	0.0	0.5	33.2	0	0.0
Kentucky	0.8	494.0	0	0.0	5.7	733.5	0	0.0
Louisiana	0.3	107.5	0	0.0	3.7	848.2	3	40.0
Maine	0.0	0.0	0	0.0	0.1	67.9	0	0.0
Michigan	2.3	633.5	0	0.0	46.3	2,341.7	3	497.0
Minnesota	1.4	1,196.9	0	0.0	13.0	1,933.9	1	80.0
Mississippi	0.0	63.4	0	0.0	0.0	963.6	4	234.8
Missouri	0.0	0.0	0	0.0	28.4	914.3	1	104.1
Montana	19.3	6,459.3	0	0.0	52.5	7,919.6	1	124.2
Nebraska	0.0	0.0	0	0.0	0.0	65.0	0	0.0
Nevada	0.1	81.4	0	0.0	0.0	81.3	1	60.3
New Hampshire	0.6	309.0	0	0.0	0.5	382.6	0	0.0
New Mexico	5.2	1,993.4	0	0.0	45.9	4,720.4	0	0.0
New York	0.0	0.0	0	0.0	0.0	0.0	0	0.0
North Carolina	0.0	502.1	0	10.2	3.3	1,161.8	2	155.8
Ohio	0.0	0.0	0	0.0	1.0	987.4	0	0.0
Oklahoma	3.4	252.0	0	0.0	4.1	158.7	0	0.0
Oregon	4.1	12,414.9	0	0.0	73.5	16,739.7	2	2.3
Pennsylvania	0.0	247.8	0	0.0	1.9	636.6	1	137.7
Puerto Rico	0.0	15.8	0	0.0	0.0	64.8	0	0.0
South Carolina	1.3	209.2	0	0.0	14.2	628.7	0	0.0
South Dakota	0.0	137.8	0	0.0	14.8	1,259.2	1	35.1
Tennessee	0.3	577.9	0	0.0	6.9	825.9	0	7.5
Texas	0.1	99.9	0	0.0	6.8	1,046.8	0	0.0
Utah	4.4	1,635.0	0	2.1	10.4	2,565.4	1	52.6
Vermont	0.4	162.7	0	0.0	0.1	101.6	0	0.0
Virginia	4.2	745.5	0	0.0	19.0	1,594.9	11	280.6
Washington	4.4	4,297.3	8	1895.2	39.0	7,779.5	0	0.0
West Virginia	7.1	887.5	0	0.0	6.2	395.2	1	14.9
Wisconsin	1.3	412.8	0	0.0	39.3	3,153.0	2	254.2
Wyoming	4.7	860.2	0	0.0	20.9	1,983.5	2	48.6
Total	100.7	67,790.0	15	3,177.4	752.5	105,679.0	76	4,578.9

Table 41—Road and bridge construction and reconstruction by State—fiscal year 1992—Continued

By Timber Purchasers								
Construction				Reconstruction				State or Commonwealth 2/
Roads		Bridges		Roads		Bridges		
Miles 3/	Cost	No.	Cost	Miles 3/	Cost	No.	Cost	
1,000 dollars		1,000 dollars		1,000 dollars		1,000 dollars		
0.3	8.3	0	0.0	6.8	106.6	0	0.0	Alabama
248.7	35,120.2	53	1,442.4	85.2	1,735.2	4	7.6	Alaska 4/
12.8	133.8	0	0.0	154.9	1,185.3	0	0.0	Arizona
43.5	459.2	0	0.0	113.0	1,030.2	0	0.0	Arkansas
46.7	939.1	0	0.0	213.7	3,367.9	0	0.0	California
26.8	403.0	0	0.0	22.8	176.6	0	0.0	Colorado
0.0	0.0	0	0.0	19.7	257.8	0	0.0	Florida
2.8	54.5	0	0.0	14.0	200.1	0	0.0	Georgia
153.0	3,853.4	0	0.0	261.5	2,527.8	1	30.7	Idaho
0.0	0.0	0	0.0	0.0	0.0	0	0.0	Illinois
0.0	0.0	0	0.0	0.0	0.0	0	0.0	Indiana
0.0	0.0	0	0.0	0.0	0.0	0	0.0	Kansas
30.2	429.9	0	0.0	28.9	290.1	0	0.0	Kentucky
4.6	53.3	0	0.0	60.2	612.4	0	0.0	Louisiana
0.0	0.0	0	0.0	0.0	0.0	0	0.0	Maine
31.7	232.6	0	0.0	63.3	391.9	0	0.0	Michigan
9.2	101.1	0	0.0	7.0	73.6	0	0.0	Minnesota
9.2	267.2	0	0.0	85.6	1,299.7	3	123.0	Mississippi
0.0	0.0	0	0.0	33.5	140.8	0	0.0	Missouri
145.4	3,299.6	0	0.0	237.1	1,889.3	1	52.8	Montana
0.0	0.0	0	0.0	0.0	0.0	0	0.0	Nebraska
0.0	0.0	0	0.0	0.0	0.0	0	0.0	Nevada
2.4	72.6	0	0.0	2.7	38.9	0	0.0	New Hampshire
6.6	79.4	0	0.0	55.0	274.2	0	0.0	New Mexico
0.0	0.0	0	0.0	0.0	0.0	0	0.0	New York
8.2	254.3	0	0.0	25.0	288.2	0	0.0	North Carolina
0.3	4.5	0	0.0	0.0	0.0	0	0.0	Ohio
0.7	11.8	0	0.0	0.0	0.0	0	0.0	Oklahoma
99.5	2,379.6	0	0.0	374.5	8,671.7	0	0.0	Oregon
9.7	271.2	0	0.0	56.7	549.0	0	0.0	Pennsylvania
0.0	0.0	0	0.0	0.0	0.0	0	0.0	Puerto Rico
2.0	69.4	0	0.0	25.1	259.2	0	0.0	South Carolina
16.3	209.0	0	0.0	89.4	921.0	0	0.0	South Dakota
11.1	165.8	0	0.0	23.5	166.3	0	0.0	Tennessee
2.5	81.2	0	0.0	53.1	852.8	0	0.0	Texas
5.9	104.7	0	0.0	15.8	126.7	0	0.0	Utah
1.0	25.5	0	0.0	0.3	25.6	0	0.0	Vermont
8.0	93.3	0	0.0	10.4	85.3	0	0.0	Virginia
43.1	1,441.5	0	0.0	66.1	769.6	0	0.0	Washington
10.0	411.1	0	0.0	13.1	329.4	1	14.2	West Virginia
11.5	90.4	0	0.0	51.7	243.6	0	0.0	Wisconsin
19.3	238.6	0	0.0	69.5	387.3	0	0.0	Wyoming
1,023.0	51,359.1	53	1,442.4	2,339.1	29,274.1	10	228.3	Total

1/ Includes funds for engineering and program support for appropriated roads and timber purchaser roads. Does not include \$5,842,400 of Washington Office funds and \$309,000 transferred to the Federal Highway Administration (FHWA). The FHWA funds provided for A&E planning and design for future year projects.

2/ States not listed had no Forest Service road programs in 1992.

3/ Does not include 57.2 miles of construction and 167.4 miles of reconstruction turned back to the Forest Service (Purchaser Election Program).

4/ Includes Tongass Timber Supply Fund, \$1,963,600, 2.5 miles construction, and 9 bridges.



Many roads are constructed and maintained to provide limited access for high-clearance vehicles. FS Photo

Table 42—Purchaser election roads constructed by the Forest Service by State—fiscal year 1992

State or Commonwealth 1/	Construction Roads		Reconstruction Roads	
	Miles	Cost	Miles	Cost
	1,000 dollars		1,000 dollars	
Alabama	0.0	0.0	3.2	26.3
California	0.4	17.6	14.1	547.6
Colorado	9.9	124.0	33.1	24.0
Florida	0.2	6.9	20.2	307.3
Georgia	0.8	22.0	8.9	123.2
Idaho	2.3	106.2	5.5	47.0
Louisiana	0.1	1.2	4.1	63.7
Mississippi	0.7	128.8	3.1	36.9
Montana	25.2	903.9	27.7	324.6
New Hampshire	0.0	6.1	0.0	5.6
Oregon	7.7	352.0	32.3	575.1
Pennsylvania	2.2	80.0	5.6	36.2
South Dakota	0.0	102.0	0.0	97.0
Tennessee	0.3	4.0	6.0	48.8
Texas	0.0	0.0	0.0	0.3
Vermont	0.5	38.6	1.7	20.7
Washington	5.1	287.4	1.9	48.0
West Virginia	1.8	72.8	0.0	0.0
Total 2/	57.2	2,253.5	167.4	2,332.3

1/ States not listed had no timber purchaser roads constructed by the Forest Service in FY 1992.

2/ Does not include General Administrative expenses.

Table 43—Road maintenance accomplishments by State--fiscal year 1992

State or Commonwealth	Cost				Miles fully maintained 1/				Miles lacking full maintenance 2/				Total Miles 6/	
	Level 1 Closed 3/	Level 2 High Clearance 4/	Levels 3,4,5 Passenger Car 5/		Level 1 Closed 3/	Level 2 High Clearance 4/	Levels 3,4,5 Passenger Car 5/		Level 1 Closed 3/	Level 2 High Clearance 4/	Levels 3,4,5 Passenger Car 5/			
			Miles	Miles			Miles	Miles			Miles	Miles		
														Miles
1,000 dollars														
Alabama	36.0	40.0	684.9		114.0	375.0	518.0		149.0	310.0	137.1		1,603.1	
Alaska 7/	77.0	133.4	1,294.1		1,045.2	976.4	765.2		165.2	419.4	127.0		3,498.4	
Arizona	162.8	812.5	2,464.1		490.1	2,344.8	2,216.4		1,760.1	21,302.9	1,347.6		29,461.9	
Arkansas	58.5	169.2	1,296.0		1,408.5	3,546.2	723.0		1,086.5	2,041.6	735.1		9,540.9	
California	539.0	4,052.5	14,095.2		2,395.1	11,060.7	7,344.3		4,107.4	15,183.6	4,938.1		45,029.2	
Colorado	439.1	1,713.4	3,442.3		1,292.2	2,882.8	3,576.9		1,647.1	5,880.2	2,299.8		17,579.0	
Florida	1.0	27.9	707.6		10.6	90.0	600.0		0.0	3,050.2	645.5		4,396.3	
Georgia	65.1	147.3	737.3		34.0	183.8	116.4		79.0	502.2	568.0		1,483.4	
Idaho	599.5	1,224.0	3,808.3		3,947.5	5,032.0	7,050.0		3,627.0	9,078.4	4,566.7		33,301.6	
Illinois	14.0	63.9	433.8		186.0	219.0	97.9		224.3	319.5	84.2		1,130.9	
Indiana	0.0	0.0	122.4		35.0	0.0	30.0		0.0	0.0	10.0		75.0	
Kansas	0.0	0.0	7.0		0.0	0.0	51.6		0.0	0.0	106.4		158.0	
Kentucky	3.0	30.4	565.4		270.0	276.0	350.0		27.1	145.3	134.4		1,202.8	
Louisiana	5.4	64.0	649.2		196.6	1,339.5	401.1		10.3	446.5	341.2		2,735.2	
Maine	1.6	5.3	64.0		29.0	5.0	24.0		0.0	2.7	9.2		69.9	
Michigan	42.4	292.2	1,586.6		1,255.0	901.6	784.3		2,802.2	4,089.4	618.5		10,451.0	
Minnesota	187.2	123.2	1,189.2		875.5	391.7	791.0		522.5	1,492.8	343.0		4,416.5	
Mississippi	17.3	133.6	556.9		339.7	562.0	606.3		243.9	582.2	240.6		2,574.7	
Missouri	20.4	127.2	269.6		0.0	639.0	595.3		92.6	1,353.3	146.0		2,826.2	
Montana	347.0	1,193.3	4,147.1		3,239.0	4,774.0	5,723.0		3,429.0	8,710.0	5,100.0		30,975.0	
Nebraska	1.7	50.3	102.4		11.2	120.0	95.0		0.0	132.9	19.5		378.6	
Nevada	38.6	38.8	307.9		167.0	598.0	436.0		119.0	2,909.0	814.0		5,043.0	
New Hampshire	8.5	56.3	265.5		129.5	71.2	97.8		30.0	10.0	40.0		378.5	
New Mexico	630.1	1,602.5	974.9		1,415.0	1,469.6	1,372.3		3,042.2	12,704.4	1,340.0		21,343.5	
New York	0.0	0.0	0.3		0.0	0.0	0.0		1.3	0.2	1.4		2.9	
North Carolina	53.1	107.0	655.1		90.0	820.0	680.0		18.1	204.6	182.1		1,994.8	
North Dakota	0.0	35.1	46.5		11.0	316.0	183.0		0.0	106.0	37.0		653.0	
Ohio	0.0	0.0	43.5		43.0	0.0	22.0		0.0	2.0	3.0		70.0	
Oklahoma	0.7	8.2	83.9		42.0	300.0	94.0		3.0	160.0	96.7		695.7	
Oregon	1,041.0	3,216.0	8,606.0		9,038.0	19,075.0	7,272.0		5,962.0	21,333.0	4,822.0		67,502.0	
Pennsylvania	18.2	52.2	364.8		103.7	264.5	393.9		88.3	62.0	104.7		1,017.1	
Puerto Rico	2.0	2.0	36.9		0.0	0.0	0.0		1.5	4.9	16.9		23.3	

See footnotes at end of table.

Table 43—Road maintenance accomplishments by State--fiscal year 1992--Continued

State or Commonwealth	Cost			Miles fully maintained 1/						Miles lacking full maintenance 2/				Total Miles 6/
	Level 1 Closed 3/	Level 2 High Clearance 4/	Levels 3,4,5 Passenger Car 5/	Level 1 Closed 3/	Level 2 High Clearance 4/	Levels 3,4,5 Passenger Car 5/	Level 1 Closed 3/	High Clearance 4/	Levels 3,4,5 Passenger Car 5/	Total				
1,000 dollars														
South Carolina	22.3	66.5	629.9	0.0	0.0	0.0	520.3	144.4	997.7	1,662.4				
South Dakota	201.1	471.8	482.4	60.9	885.5	690.7	243.5	2,653.5	11.0	4,545.1				
Tennessee	6.0	48.9	493.8	19.0	240.0	407.0	44.1	638.3	107.8	1,456.2				
Texas	17.7	167.3	534.7	117.0	696.0	183.0	78.0	1,189.0	276.0	2,539.0				
Utah	148.6	669.1	1,878.6	128.2	2,510.9	1,849.6	394.0	6,004.3	983.1	11,870.1				
Vermont	11.8	76.9	165.4	0.0	0.0	0.0	55.5	92.3	85.4	233.2				
Virginia	41.6	127.0	1,122.3	118.0	411.0	238.5	242.1	948.8	751.7	2,710.1				
Washington	656.2	1,968.2	4,800.5	1,624.0	4,477.0	3,360.0	2,179.0	8,123.0	2,527.0	22,290.0				
West Virginia	18.4	51.9	1,156.4	220.5	573.4	601.4	38.1	167.7	90.9	1,692.0				
Wisconsin	31.9	187.7	1,247.3	458.0	1,936.0	1,274.0	187.0	2,168.0	1,478.0	7,501.0				
Wyoming	171.9	403.5	1,638.3	1,204.8	4,856.5	1,595.1	559.6	1,695.8	1,102.1	11,013.9				
Total 7/	5,737.7	19,760.5	63,758.3	32,163.8	75,220.1	53,210.0	33,779.8	136,364.3	38,386.4	369,124.4				

1/ Includes miles of road maintained at a level consistent with current uses.

2/ Includes miles of road maintained at a level less than adequate for current uses.

3/ Roads closed to motorized traffic.

4/ Roads maintained for use by high clearance vehicles.

5/ Roads maintained for passenger car use.

6/ Road mile changes include roads acquired through land and right-of-way purchases, inventory revisions and new construction.

7/ Does not include \$1,521,807 of Washington Office and National Commitment funds.

Table 44--State and Private Forestry funding--fiscal year 1992 compared to long-term program costs

	1992 Actual	1995 RPA 1/ 1,000 constant 1992 dollars	Percent of 1992 Actual to 1995 RPA
Appropriated accounts			
Forest pest mangement	57,205	68,357 2/	84
Fire protection	16,618	21,362	78
Forest management and utilization	68,116	201,867	34
Special projects	20,848	- 3/	N/A 4/
Hurricane Andrew/Iniki	4,100		
Subtotal	166,887	291,586	57
Transfer accounts			
Rural community fire protection	3,500	- 5/	N/A
Watershed and flood prevention	2,100	-	N/A
Watershed planning	303	-	N/A
Resource conservation and development	961	-	N/A
River basin surveys and investigations	850	-	N/A
Forestry Incentives Program 6/	1,245	-	N/A
Agricultural Conservation Program 6/	1,944	-	N/A
Subtotal	10,903	-	N/A
Total	177,790	N/A	N/A

1/ Information from 1990 RPA Program

2/ Includes both cooperative and Federal pest management.

3/ Included in forest management and utilization.

4/ Not applicable.

5/ Not reported in the 1990 RPA.

6/ Includes only technical assistance allocated for the Forestry Incentives and Agricultural Conservation Programs (administered jointly by ASCS and FS).

	1992	1991	1990	1989	1988
	<i>1,000 dollars actual</i>				
Appropriated accounts					
Forest pest management	57,205	60,150	47,586	49,677	44,441
Fire protection	16,618	15,749	17,078	13,851	13,770
Forest management and utilization	68,116	74,206	25,321	10,265	10,783
Special projects	20,848	32,309	19,663	12,875	10,875
Hurricane Andrew/Iniki	4,100				
Subtotal	166,887	182,414	109,648	86,668	79,869
Transfer accounts					
Rural community fire protection	3,500	3,500	3,091	3,091	3,091
Watershed and flood prevention	2,100	2,181	2,698	3,198	2,777
Watershed planning	303	228	228	228	241
Resource conservation and development	961	653	724	766	803
River basin surveys and investigations	850	850	852	852	852
Forestry Incentives Program 1/	1,245	1,245	1,245	1,245	1,189
Agricultural Conservation Program 1/	1,944	1,824	1,730	1,769	1,769
Subtotal	10,903	10,481	10,568	11,149	10,722
Total	177,790	192,895	120,216	97,817	90,591

1/ Includes only technical assistance allocated for the Forestry Incentives and Agricultural Conservation Programs (administered jointly by ASCS and FS).

Table 46—Summary of State and Private Forestry 1992 accomplishments compared to long-term program levels

	Unit of measure	2/	1992 Actual	1992 Funded	Percent of 1992 Actual to 1992 Funded	1991 Actual	Percent change comparison		
							1995 1/ RPA	1991 Actual to 1992 Actual	1992 Actual to 1995 RPA
Appropriated accounts									
Forest pest management 3/									
Insect and disease management surveys	MM acres		668	580	119	692	N/A 4/	-3	N/A
Insect and disease suppression	MM acres		1.7	- 5/	-	1.5	N/A	13	N/A
Insect and disease special projects	Projects		42	-	-	39	N/A	8	N/A
Forest management and utilization									
Forest resource management									
Forest Land management plans	MM acres		3.8	3.9	105	4.1	9	-7	120
Timber harvested	M cubic feet		227	-	-	200	N/A	14	N/A
Reforestation 6/	M acres		1,000	-	-	1,100	1,300	-9	18
Timber stand improvement 7/	M acres		294	-	-	257	870	14	239
Woodland owners assisted	M owners		190	-	-	153	N/A	24	N/A
Wood utilization	MM cubic feet		-	-	-	-	N/A	-	N/A
Seedling, nursery, and tree improvement	MM seedlings		456 8/	-	-	483	N/A	-6	N/A
Urban forestry assistance	Areas assisted		13,942	-	-	11,067	N/A	26	N/A
Management improvement				-					
State forest resource planning	Person Years		28	-	-	28 9/	N/A	0	N/A
Transfer accounts									
Rural community fire protection, FmHA									
Watershed and flood prevention, SCS 10/	M approved applications		3.5	3.4	103	3.5	N/A	0	N/A
Watershed planning, SCS	Projects		30	30	83	25	N/A	20	N/A
Resource conservation and development, SCS	Plans		73	73	41	30	N/A	143	N/A
River basin surveys and investigations, SCS	Projects		48	48	113	54	N/A	-11	N/A
Forestry Incentives Program, ASCS 11/	Plans		53	51	100	51	N/A	4	N/A
Reforestation	M acres		146	-	-	150	N/A	-3	N/A
Timber stand improvement	M acres		28	-	-	31	N/A	-10	N/A
Agricultural Conservation Program, ASCS 11/									
Reforestation	M acres		103	-	-	110	N/A	-6	N/A
Timber stand improvement	M acres		30	-	-	38	N/A	-21	N/A

1/ Information from 1990 RPA Program.

2/ M = thousand, MM = million.

3/ Includes accomplishments on National Forest System and other Federal lands, as well as State and private lands.

4/ N/A = not available.

5/ — = not applicable.

6/ Includes Conservation Reserve Program, Forestry Incentives Program and Agricultural Conservation Program accomplishments.

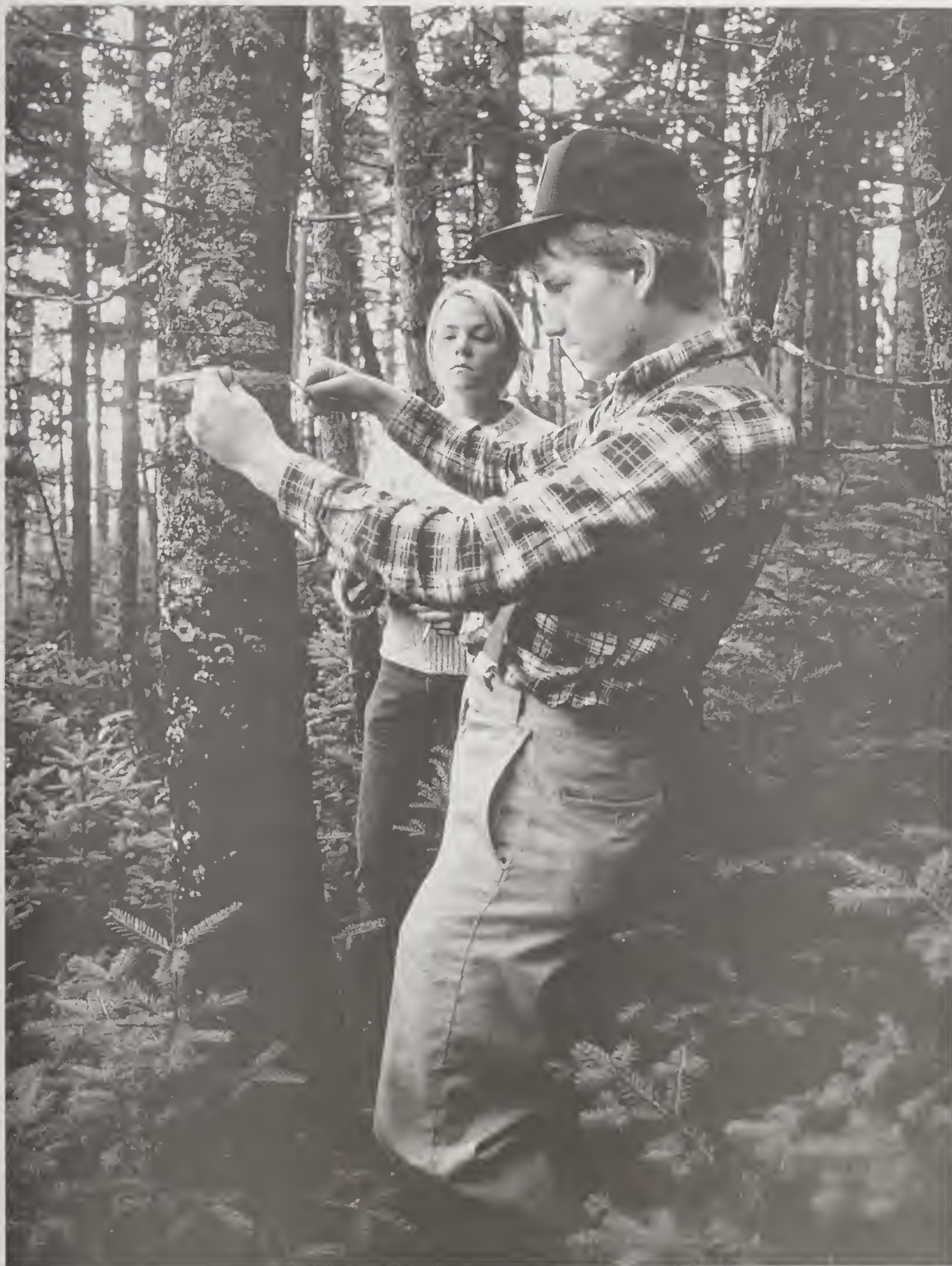
7/ Includes Forestry Incentives Program and Agricultural Conservation Program accomplishments.

8/ Areas represent more than one assistance per community; e.g., New York, Philadelphia, etc.

9/ Includes Emergency Watershed Protection.

10/ Accomplishments for 1991 are estimates; actual data is not available from SCS.

11/ Same as footnote 10, except for agency.



FS Photo

State or territory	1991 plans 1/	1991 acres 1/	1992 plans 2/	1992 acres	Cumulative plans 2/	Cumulative acres
Alabama	135	14,930	290	24,359	667	53,569
Alaska	0	0	1	176,086	1	176,086
American Samoa	0	0	0	0	0	0
Arizona	2	127,129	17	84,293	21	211,986
Arkansas	20	7,166	100	87,000	120	94,166
California	0	0	108	35,690	108	35,690
Colorado	118	61,558	423	84,490	550	167,948
Connecticut	0	0	22	5,003	22	5,003
Delaware	32	3,750	12	581	44	4,331
District of Columbia	0	0	0	0	0	0
Florida	57	47,000	92	46,660	153	113,660
Georgia	44	63,462	220	85,458	268	151,707
Guam	0	0	0	0	0	0
Hawaii	0	0	0	0	0	0
Idaho	177	12,338	150	10,500	543	35,219
Illinois	954	61,708	996	45,294	2,120	118,206
Indiana	1,377	48,200	1,076	15,462	3,845	116,162
Iowa	588	13,800	1,246	27,314	2,064	47,914
Kansas	73	1,979	307	6,966	402	9,402
Kentucky	893	80,552	895	90,345	2,140	196,566
Louisiana	9	490	68	9,328	77	9,818
Maine	342	41,322	357	27,818	699	69,140
Maryland	110	7,148	526	31,090	810	44,203
Massachusetts	524	42,666	76	4,515	771	67,571
Michigan	50	6,000	15	1,444	70	7,591
Minnesota	920	90,363	1,640	96,850	2,994	225,091
Mississippi	92	24,180	102	15,903	236	51,074
Missouri	323	31,936	177	25,519	800	86,426
Montana	17	2,800	75	21,000	92	23,800
Nebraska	17	500	86	7,267	103	7,767
Nevada	9	12,700	17	2,080	30	15,359
New Hampshire	237	48,418	265	37,615	808	111,618
New Jersey	0	0	6	828	6	828
New Mexico	9	7,984	43	23,807	52	31,791
New York	1,574	114,796	1,657	79,712	5,048	306,989
North Carolina	61	15,539	78	16,964	141	33,863
North Dakota	137	9,343	75	4,000	251	15,083
Northern Marianas	0	0	0	0	0	0
Ohio	1,151	40,161	1,811	40,915	4,198	125,250
Oklahoma	11	4,254	72	19,915	84	30,569
Oregon	84	20,598	199	27,624	284	50,007
Pennsylvania	0	0	36	2,428	36	2,428
Puerto Rico	0	0	0	0	0	0
Rhode Island	33	826	152	1,812	185	2,638
South Carolina	11	2,433	284	75,694	295	78,127
South Dakota	17	508	164	3,220	199	4,224
Tennessee	38	9,795	127	27,721	166	37,533
Texas	326	30,156	110	11,452	586	59,608

See footnotes at end of table.

Table 47--Summary of forest stewardship program accomplishments by State--fiscal years 1991-1992--
Continued

State or territory	1991 plans 1/	1991 acres 1/	1992 plans 2/	1992 acres	Cumulative plans 2/	Cumulative acres
Utah	7	6,160	21	11,178	28	17,338
Vermont	214	24,930	128	14,067	343	39,118
Virgin Islands	0	0	0	0	0	0
Washington	256	12,970	185	22,595	448	37,257
West Virginia	191	35,800	395	51,281	761	117,367
Wisconsin	2,178	119,775	5,898	110,184	9,392	299,719
Wyoming	8	10,442	189	21,563	537	34,413
Total	15,417	1,320,556	22,981	1,674,882	43,598	3,581,223

1/ States not listed had no data.

2/ Landowner forest stewardship plans

Table 48--Summary of selected cooperative forest management and processing program activities--selected fiscal years

Fiscal year	Woodland owners assisted <i>Number</i>	Timber sale assistance-- volume marked <i>MBF 1/</i>	Loggers and processors assisted <i>Number</i>
1945	8,093	411,330	0
1950	22,828	518,566	0
1955	34,828	549,373	8,182
1960	82,188	569,178	8,099
1965	99,074	716,950	9,248
1970	115,197	1,225,520	13,620
1971	127,828	860,950	14,627
1972	274,001	955,627	5,290
1973	106,422	1,578,664	4,855
1974	117,990	907,311	5,353
1975	140,940	677,532	5,405
1976	105,184	596,599	15,318
1976 -77 (T.Q.) 2/	25,253	220,649	5,849
1977	133,619	921,171	29,101
1978	165,329	1,120,743	12,749
1979	183,585	755,103	11,393
1980	176,385	870,964	11,582
1981	164,279	683,181	18,609
1982	141,472	841,475	15,470
1983	136,265	872,125	8,717
1984	151,539	1,033,440	10,082 3/
1985	134,338	913,411	- 4/
1986	137,753	855,813	- 4/
1987	158,353	1,225,896	- 4/
1988	167,432	890,581	- 4/
1989	153,855	1,242,564	- 4/
1990	148,673	1,597,931	- 4/
1991	153,090	1,697,861	- 4/
1992	190,211	791,462 5/	- 4/

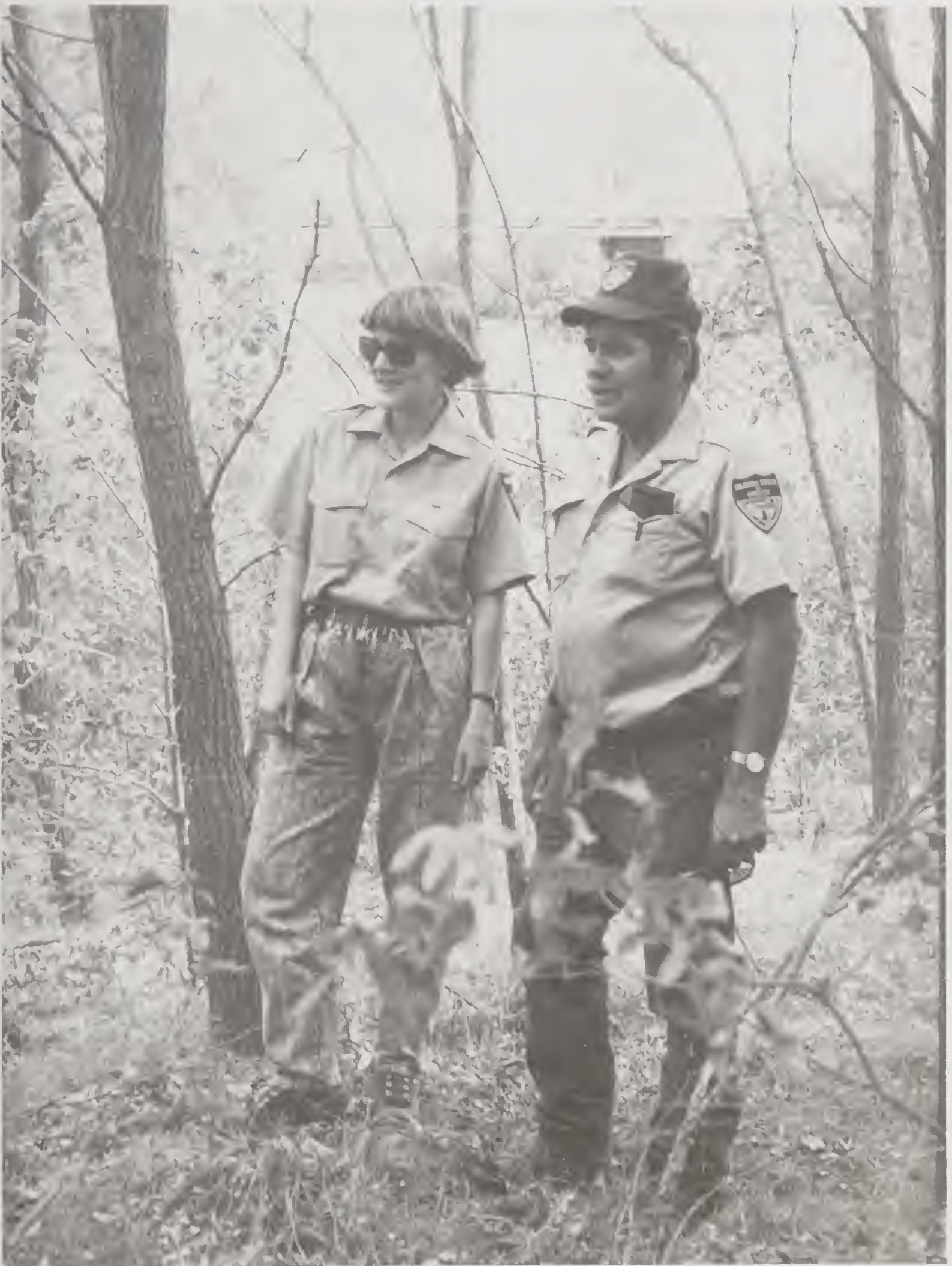
1/ MBF = thousand board feet.

2/ Transition quarter.

3/ Not all states reported.

4/ Inadequate data due to lack of State grants in wood utilization program.

5/ Decline due to new programs that emphasize multi-resource management rather than timber harvesting.



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Table 49—Summary of selected cooperative forest management and processing activities by Region--
fiscal year 1992

Assistance activity	Unit of measure 1/	Regions				
		Northern	Rocky Mountain	South- western	Inter- mountain	Pacific Southwest
Woodland owners assisted	Number	7,406	6,184	131	934	3,417
Forest management plans 2/ prepared	Number	662	446	44	68	129
	Acres	70,770	18,326	92,084	34,018	110,398
Reforestation:						
Planting	Acres	1,278	744	436	986	12,314
Seeding	Acres	82	64	0	20	36
Management for natural regeneration	Acres	288	3,130	3,692	357	9,181
Timber stand improvement	Acres	1,386	4,964	154	3,017	3,456
Outdoor recreation development	Acres	708	2,475	3,957	2,530	597
Wildlife habitat development	Acres	247	6,152	4,882	1,815	14,538
Forested range improvement	Acres	0	3,054	3,027	2,330	6,222
Timber sale assistance volume harvested	M cubic feet	3,882	4,105	2,044	629	2,590
Urban forestry assistance activities	Urban areas assisted	490	1,665	51	253	675
Referrals to consulting foresters	Number	78	216	35	22	778

See footnotes at end of table.

Table 49—Summary of selected cooperative forest management and processing activities by Region--
fiscal year 1992--Continued

Assistance activity	Unit of measure 1/	Regions				Total
		Pacific Northwest	Alaska	Southern	Northeastern Area	
Woodland owners assisted	Number	8,736	61	83,398	79,944	190,211
Forest management plans 2/ prepared	Number	1,023	10	38,718	21,028	62,128
	Acres	55,090	202	2,260,406	1,138,632	3,779,926
Reforestation:						
Planting	Acres	31,042	22	534,436	96,470	677,728
Seeding	Acres	0	0	33,602	616	34,420
Management for natural regeneration	Acres	11,874	0	56,138	47,902	132,562
Timber stand improvement	Acres	37,574	14	169,712	73,496	293,773
Outdoor recreation development	Acres	63	0	187,372	86,990	284,692
Wildlife habitat development	Acres	19,034	0	418,087	194,310	659,065
Forested range improvement	Acres	16,083	0	31,484	4,904	67,104
Timber sale assistance 3/ volume harvested	M cubic feet	17,886	0	99,243	96,347	226,726
Urban forestry assistance activities	Urban areas assisted	95	0	3,806	6,907	13,942
Referrals to consulting foresters	Number	467	0	7,125	9,412	18,133

1/ M = thousand

2/ Forest stewardship program plans and acres separately recorded in Table 47.

3/ Decline from FY 1991 due to new programs that emphasize multi-resource management rather than timber harvesting.

Table 50--Summary of selected cooperative forest management and processing activities by State--
fiscal year 1992

State, Commonwealth, or Territory 1/	Woodland owners assisted <i>Number</i>	Reforestation assistance <i>Acres</i>	Timber stand improvement assistance <i>Acres</i>	Timber sale assistance-- harvest volume <i>1,000 cubic feet</i>	State nursery production <i>1,000 trees</i>
Alabama	25,514	60,078	79,717	0	35,030
Alaska	61	22	14	0	204
American Samoa	95	162	0	0	3
Arizona	73	2,986	67	1,444	0
Arkansas	1,655	27,588	1,146	19,366	13,015
California	2,812	21,052	2,990	2,584	2,791
Colorado	3,074	1,282	450	3,398	1,964
Com. of N. Marianas	3	1	0	0	4
Connecticut	320	609	577	0	1,200
Delaware	272	3,260	337	111	0
Florida	3,406	30,986	10,701	1,297	18,480
Georgia	9,261	78,096	23,008	0	51,063
Guam	25	123	25	0	57
Hawaii	222	153	157	6	422
Idaho	5,211	825	907	728	757
Illinois	16,471	9,266	4,557	1,498	4,294
Indiana	2,741	7,153	9,850	1,585	5,178
Iowa	2,099	8,516	3,828	653	3,873
Kansas	740	330	553	62	303
Kentucky	1,456	6,142	2,317	0	8,541
Louisiana	2,381	30,767	882	0	34,920
Maine	4,201	1,883	3,933	540	0
Maryland	2,960	5,375	4,080	4,012	5,073
Massachusetts	1,500	10,783	1,435	10,702	0
Michigan	431	7,162	11,804	4,379	4,778
Minnesota	8,398	21,121	3,536	10,417	14,262
Mississippi	14,797	144,521	16,455	0	40,100
Missouri	1,633	6,586	1,317	1,962	5,560
Montana	806	370	445	3,139	1,188
Nebraska	1,161	223	18	42	0
Nevada	686	395	2,454	236	200
New Hampshire	9,424	653	1,315	639	387
New Jersey	2,039	833	1,195	1,116	483
New Mexico	58	1,142	87	600	60
New York	3,025	2,856	3,081	2,013	4,200
North Carolina	6,877	93,922	3,948	0	22,420
North Dakota	1,389	453	34	15	1,021
Ohio	6,084	4,106	4,603	1,357	4,385
Oklahoma	406	1,464	93	0	2,744
Oregon	7,379	32,230	31,267	3,264	0
Other Pacific Islands	258	37	271	0	37
Palau	2	3	13	0	21
Pennsylvania	2,058	1,414	1,733	558	2,881
Puerto Rico	1,119	405	560	0	290
Rhode Island	68	157	327	163	0
South Carolina	3,489	52,653	4,111	0	31,984
South Dakota	687	1,461	2,054	90	1,149
Tennessee	1,987	5,085	107	1,667	4,656
Texas	2,221	29,922	3,173	13,304	23,560
Utah	248	968	563	393	560
Vermont	4,402	562	3,942	17,106	650

See footnote at end of table.

Table 50—Summary of selected cooperative forest management and processing activities by State--
fiscal year 1992--Continued

State, Commonwealth, or Territory 1/	Woodland owners assisted <i>Number</i>	Reforestation assistance <i>Acres</i>	Timber stand improvement assistance <i>Acres</i>	Timber sale assistance-- harvest volume <i>1,000 cubic feet</i>	State nursery production <i>1,000 trees</i>
Virginia	8,829	62,547	23,494	63,609	56,706
Washington	1,357	10,686	6,307	14,622	8,784
West Virginia	3,452	7,348	2,117	2,602	1,733
Wisconsin	8,366	45,345	9,929	34,934	20,494
Wyoming	522	642	1,889	513	0
Total	190,211	844,710	293,773	226,726	442,465

1/ States not listed have no cooperative forest management and processing activities.

Table 51--Small watershed protection accomplishments--fiscal years 1988-92 (Watershed Protection and Flood Prevention Act of 1954) 1/

	Unit of measure	1992	1991	1990	1989	1988
Land treatment 2/						
Forest land	Acres	15,480	26,967	10,477	8,735	9,692
Cropland	Acres	947	745	279	2,395	2,079
Pastureland	Acres	174	728	308	156	831
Total land treatment	Acres	16,601	28,440	11,064	11,286	12,602
Land owners assisted	Number	1,371	1,990	1,144	1,238	1,068

1/ Accomplishments are limited to activities accomplished solely by small watershed protection program funds.

2/ Reported in land use categories consistent with those reported by the Soil Conservation Service.

Table 52--Flood prevention accomplishments--fiscal years 1988-92 (Watershed Protection and Flood Prevention Act of 1954) 1/

	Unit of measure	1992	1991	1990	1989	1988
Land treatment 2/						
Forest land	Acres	5,680	11,700	4,457	15,349	6,742
Cropland	Acres	- 3/	-	970	253	454
Pastureland	Acres	-	-	188	259	182
Total land treatment	Acres	5,680	11,700	5,615	15,861	7,378
Land owners assisted	Number	1,853	1,920	2,116	2,091	2,932

1/ Accomplishments are limited to activities accomplished solely by small watershed protection program funds.

2/ Reported in land use categories consistent with those reported by the Soil Conservation Service.

3/ No accomplishments reported for FY 1991 and 1992 on cropland and pastureland.

Table 53—Wildfires on State and private lands protected under the Cooperative Forestry Assistance Act (P.L. 95-313)--
calendar year 1991

State, Commonwealth, or Territory	Acres protected	Lightening fires <i>Number</i>	Person-caused fires <i>Number</i>	Total fires <i>Number</i>	Acres burned <i>Number</i>
Alabama	25,726,491	18	5,887	5,905	54,757
Alaska	13,400,000	130	363	493	17,429
Arizona	22,447,000	61	362	423	9,740
Arkansas	18,604,989	59	1,975	2,034	27,278
California	32,057,391	319	5,925	6,244	23,154
Colorado	25,958,109	176	1,273	1,449	6,576
Connecticut	2,390,000	0	610	610	1,678
Delaware	557,000	0	34	34	539
Florida	25,380,158	422	3,563	3,985	85,948
Georgia	27,279,400	67	8,300	8,367	30,660
Guam	81,643	0	473	473	1,552
Hawaii	3,306,300	2	166	168	25,118
Idaho	6,025,690	201	293	494	12,979
Illinois	10,670,300	3	671	674	7,491
Indiana	7,328,000	2	208	210	604
Iowa	7,612,000	17	1,746	1,763	5,700
Kansas	4,640,000	153	5,241	5,394	174,042
Kentucky	11,641,259	5	1,510	1,515	68,981
Louisiana	18,931,000	4	3,117	3,121	35,756
Maine	17,743,000	126	984	1,110	3,098
Maryland	3,400,000	12	696	708	8,249
Massachusetts	3,225,200	17	6,168	6,185	9,584
Michigan	20,600,276	19	393	412	1,472
Minnesota	45,036,693	28	1,674	1,702	51,920
Mississippi	19,858,422	6	4,737	4,743	55,604
Missouri	42,350,000	23	4,230	4,253	75,991
Montana	48,633,365	223	375	598	212,448
Nebraska	49,083,520	135	1,523	1,658	41,648
Nevada	20,730,530	91	71	162	13,143
New Hampshire	4,987,200	10	396	406	29,574
New Jersey	31,500	8	1,839	1,847	4,257
New Mexico	42,500,000	115	403	518	36,669
New York	18,336,406	21	511	532	3,394
North Carolina	19,856,385	48	4,941	4,989	24,650
North Dakota	31,878,661	71	433	504	14,750
Ohio	5,822,095	3	506	509	2,679
Oklahoma	5,944,557	16	1,734	1,750	53,806
Oregon	15,600,000	399	711	1,110	4,069
Pennsylvania	19,541	24	1,290	1,314	3,743
Puerto Rico	0	0	5,438	5,438	10,044
Rhode Island	433,000	0	193	193	269
South Carolina	12,558,258	31	5,004	5,035	32,833
South Dakota	43,556,390	165	650	815	43,782
Tennessee	25,668,400	9	2,475	2,484	25,001
Texas	22,123,000	6	992	998	19,182
Utah	15,000,000	163	137	300	7,721
Vermont	47,000,000	3	285	288	747
Virginia	13,686,056	39	1,691	1,730	6,488
Washington	12,500,000	186	988	1,174	40,040
West Virginia	12,594,200	10	1,390	1,400	34,697
Wisconsin	18,898,000	15	1,025	1,040	1,765
Wyoming	29,108,929	292	544	836	61,944
Total	932,800,314	3,953	96,144	100,097	1,525,243

Table 54--Forest Research funding--fiscal year 1992 compared to long-term program trends

	1992 Actual	1995 RPA 1/	Percent of 1992 Actual to 1995 RPA
	<i>1,000 constant 1992 dollars</i>		
Appropriated funds			
Forest protection research	40,770	55,120	74
Resource analysis research	33,228	40,560	82
Forest management and utilization research	64,856 2/	71,760	90
Forest environment research	41,655	59,280	70
Special projects, competitive grants		- 3/	N/A 4/
Research Challenge Cost-Share program	N/A	-	N/A
Subtotal	180,509	226,720	80
Research construction	3,558	-	N/A
Total, appropriated accounts	184,067	-	N/A
Reimbursable accounts	22,857	-	N/A
Grand total	206,924	N/A	N/A

1/ Information from 1990 RPA Program.

2/ Actual 1992 funding for forest management plus forest products and harvesting research.

3/ Not reported in the RPA Program.

4/ Not applicable.

	1992	1991	1990 2/	1989	1988
<i>1,000 actual dollars</i>					
Appropriated funds					
Forest protection research	40,770	38,196	34,742	33,181	31,490
Resource analysis research	33,228	29,414	27,052	25,617	25,353
Forest management research	39,216	36,562	32,216	26,972	26,548
Forest environment research	41,655	40,718	35,313	31,100	29,259
Forest products and harvesting research	25,640	22,739	21,602	20,497	19,860
Special projects, competitive grants 3/	0	0	0	0	(3,000)
Research Challenge Cost-Share program	0	0	0	500 4/	0
Subtotal	180,509	167,629	150,925	137,867	132,510
Research construction (subtotal)	3,558	18,374	4,408	1,550	2,908
Total, appropriated accounts	184,067	186,003	155,333	139,417	135,418
Reimbursable accounts (subtotal)	22,857	10,572	10,253	12,346	14,152
Grand total	206,924	196,575	165,586	151,763	149,570

1/ Budget structure was revised in fiscal year 1989 into five major budget line items. General Administration has been eliminated from individual line items. Total appropriated General Administration is included in tables 2 and 3.

2/ Post sequestration with supplemental.

3/ New account in 1985. Funds are transferred to the Competitive Research Grants Office, Cooperative State Research Service, Department of Agriculture, which administers the competitive grants research program.

4/ New account in 1989; \$100,000 funded within each budget line item for fiscal year 1989.

Table 56—Extramural research funded through Forest Service research appropriations--fiscal years 1991-92

Type of recipient	1992		1991	
	1,000 dollars	Number of grants	1,000 dollars	Number of grants
Domestic grantees				
Universities and colleges:				
Land Grant research institutions	22,060	765	13,099	511
1890 Land Grant and predominately black institutions	1,402	42	1,242	40
Other non-Land Grant institutions	2,929	111	2,125	93
Subtotal, universities and colleges	26,391	918	16,466	644
Other domestic				
Profit organizations	437	14	193	5
Nonprofit institutions and organizations	1,007	50	1,074	36
Federal, State, and local governments	605	16	506	17
Private individuals	346	39	210	16
Small business innovation research	702	10	62	4
Industrial firms 1/	5	2		
Subtotal, other domestic	3,102	131	2,045	78
Total, domestic	29,493	1,049	18,511	722
Foreign grantees				
Universities and colleges	73	8	129	9
Nonprofit institutions and organizations	21	2	85	3
Private individuals	34	5	25	4
Total, foreign grantees	128	15	239	16
Grand total	29,621	1,064	18,750	738

1/ New category added in FY 1992.



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Table 57—Research publications by major subject area--fiscal years 1989-92

	Number of publications				RPA Theme Crosswalk 1/
	1992	1991	1990	1989	
Environmental Research 2/					
Watershed management	164	126	112	96	1
Wildlife	190	204	121	147	1
Range	38	79	51	59	1
Fisheries habitat	34	46	27	17	1
Disturbed areas rehabilitation	14	19	51	50	2
Atmospheric deposition and air pollution	55	15	180	123	4
Subtotal	495	489	542	492	
Insect and Disease Research					
Insect detection and evaluation	85	46	42	34	3
Insect biology	86	77	43	57	3
Insect control and management strategies	51	58	92	69	3
Disease detection and evaluation	63	31	37	43	3
Disease biology	30	61	68	44	3
Disease control and management strategies	39	23	55	31	3
Mycorrhizae	23	11	24	25	3
Wood products organisms	26	30	22	25	3
Subtotal	403	337	383	328	
Fire and Atmospheric Sciences Research 2/					
Fire prevention, hazard reduction, and prescribed burning	0	0	22	0	0
Fire management methods and systems	0	0	16	0	0
Fire physics, chemistry (science) and behavior	40	23	13	7	3
Fire economics and management	40	45	8	15	3
Fire ecological relations and effects	20	32	25	34	3
Meteorology and climatology	27	31	21	19	3
Air resource management	4	20	0	13	3
Global change 3/	70	36	0	0	4
Subtotal	201	187	105	88	
Forest Management Research					
Forest biology	195	268	90	118	3
Silviculture and management	310	200	160	176	2
Growth and yield	53	45	92	83	2
Genetics and tree improvement	92	61	65	89	3
Subtotal	650	574	407	466	
Economics, Marketing and Recreation Research					
Forest resource inventory and analysis	123	107	120	109	2
Forest economics	215	142	159	190	2
Forest recreation	234	86	82	54	1
Urban and community forestry	2	46	58	17	4
Subtotal	574	381	419	370	

See footnotes at end of table.

	Number of publications				RPA Theme Crosswalk 1/
	1992	1991	1990	1989	
Products and Engineering Research					
Forest engineering systems	73	50	46	40	2
Wood structural engineering	66	58	50	47	3
Chemistry, fiber, and fuel products	61	78	43	90	3
Utilization potential and processing of wood	108	79	99	54	2
Protection of wood in use	35	23	22	24	3
Subtotal	343	288	260	255	
NAPAP and Forest Response Program 2/	0	106	0	0	0
General	7	42	49	79	3
Subtotal	7	148	49	79	
Grand total	2,673	2,404	2,165	2,078	

1/ RPA Theme crosswalk numbers are shown to identify which areas support each of the four themes:

- 1 - Research to enhance recreation, wildlife and fisheries resources;
- 2 - Research to provide for environmentally acceptable commodity production;
- 3 - Research to provide for improved scientific knowledge about natural resources; and
- 4 - Research to respond to global resource issues.

2/ In FY 1991, selected publications from Environmental Research and Fire and Atmospheric Research were included in a new category: National Acid Precipitation Assessment Program (NAPAP) and Forest Response Program.

3/ The Global Change category was added in FY 1991 to reflect the increased research emphasis in this subject area.

Table 58—Number of paid employees by occupational category for selected fiscal years, as of September 30, 1992

Occupation	1992	1991	1990	1985	1980
Professional	13,318	12,908	12,376	10,896	10,881
Administrative	4,663	4,409	4,211	3,340	2,714
Technical	24,812	23,302	22,020	24,007	26,902
Clerical	4,274	4,312	4,454	5,421	7,151
Other	828	884	914	321	851
Wage System	2,681	2,867	2,817	2,953	3,331
Total	50,576	48,682	46,792	46,938	51,830
Full-time equivalents (FTE's) 1/	43,427	42,221	42,342	38,524	49,005

1/ One FTE equals 2,080 paid hours of employment. These data include emergency FTE's, which do not count against personnel ceilings.

Table 59—Number of paid employees by type of appointment for selected fiscal years, as of September 30, 1992

Type of Appointment	1992	1991	1990	1985	1980
Permanent 1/	35,425	34,861	33,781	32,924	37,236
Temporary/Excepted 2/	15,151	13,821	13,011	14,014	14,594
Total	50,576	48,682	46,792	46,938	51,830

1/ Permanent are those employees who have career or career-conditional appointments.

2/ Temporary/excepted employees are any non-permanent employees who are paid from agency funds. Includes summer, seasonal, casual fire fighters, cooperative education, stay-in-school, and many other types of employees. Therefore, on September 30, 1992, there were 15,151 non-permanent paid employees. These data do not include some HRP Programs, such as volunteers (who are not paid salary) and the Senior Community Service Employment Program (who are paid by the Department of Labor).

Table 60—Number and percent of all permanent and excepted-conditional employees by race/national origin and gender as of September 30, 1992

Race/National Origin	Women	Men	Total	Percent
American Indian/Alaskan Native	693	973	1,666	4.6
Asian/Pacific Islander	269	243	512	1.4
Black	797	690	1,487	4.1
Hispanic	668	1,187	1,855	5.1
White	11,937	18,680	30,617	84.7
Total	14,364	21,773	36,137	100
Percent by gender	39.7	60.3	100	

Table 61--Summary of Forest Service Human Resource Programs--fiscal year 1992

	Program funding Million dollars	Value of work accomplished Million dollars	Persons served Number	Percent		Work accomplished Person years	Percent placement	Return per dollar invested Dollars
				Women Percent	Minority Percent			
Youth Conservation Corps 1/	Unfunded	3.3	1,185	44	16	216	N/A 2/	1.32
Job Corps 3/	65.7	23.3	9,878	15	44	3,884	81	N/A
Senior Community Service Employment Program 3/	25.8	40.6	5,651	40	22	2,581	16	1.57
Volunteers in the National Forests 4/	Unfunded	41.2	108,977	34	9	2,577	N/A	N/A
Hosted programs	Unfunded	17.9	16,777	14	30	1,181	N/A	N/A
Total	91.5	126.3	142,468	-	-	10,439	-	-

1/ Funds were not directly appropriated for Youth Conservation Corps; the Congress earmarked not less than \$1 million to be expended from funds available to the Forest Service. We operated a \$2.5 million YCC program.

2/ N/A = not applicable.

3/ Statistics are for the July 1, 1991, through June 30, 1992, program year.

4/ Statistics include 4,641 Touch America Project (TAP) enrollees.



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Table 62--Summary statement of receipts and obligations--fiscal years 1991-92 1/

	1992		1991		Percent change 1991 to 1992
	Receipts	Obligations	Receipts	Obligations	Receipts Obligations
	1,000 constant 1992 dollars				
National Forest programs					
Cash receipts:					
Sale of timber and use of other forest resources	591,407	0	744,824	0	-21
Use of National Grasslands & land utilization areas	22,881	0	26,820	0	-15
Timber sale area betterment (K-V) 2/	251,267	0	197,399	0	27
Cooperative work for others	52,110	0	54,575	0	-5
Brush disposal	30,271	0	40,468	0	-25
Miscellaneous (sales, rentals, damages, etc.) 3/	6,356	0	8,800	0	-28
Restoration of forest lands and improvements	140	0	140	0	0
Golden Eagle Passports	8	0	6	0	33
Timber salvage sales	171,831	0	144,194	0	19
Operation & maintenance of quarters	6,531	0	6,364	0	3
Gifts, donations, and bequests	742	0	1,887	0	-61
Subtotal	1,133,544	0	1,225,477	0	-8
Cash receipts from NFS lands collected in conjunction with, and deposited to, accounts of other agencies	171,874	0	111,450	0	54
Non-cash income (roads built by timber purchasers)	88,880	0	104,579	0	-15
Total	1,394,298	0	1,441,506	0	-3
Obligations					
Operating costs	0	2,489,270	0	2,202,589	0
Capital outlay	0	339,238	0	307,531	0
Total	0	2,828,508	0	2,510,120	0
Other Forest Service programs					
Forest Research programs:					
Forest research	0	212,274	0	175,688	0
Research construction	0	76,228	0	22,575	0
Cooperative research work 4/	0	6,468	0	4,106	0
Gifts, donations, and bequests for forest rangeland research	7	1,046	31	1,251	-77
Tongass Timber Supply Fund	0	76	0	1,493	0
Subtotal	7	296,092	31	205,113	-77

See footnotes at end of table.

Table 62--Summary statement of receipts and obligations--fiscal years 1991-92--Continued

	1992		1991		Percent change 1991 to 1992
	Receipts	Obligations	Receipts	Obligations	Receipts Obligations
	1,000 constant 1992 dollars				
State and Private Forestry programs					
State and Private Forestry cooperation	0	182,198	0	159,370	0 14
Rural community fire protection	0	3,361	0	3,353	0 0
Flood prevention and watershed protection	0	2,227	0	3,125	0 -29
Licensee programs (Woodsey Owl and Smokey Bear)	34	119	97	-155	-65 -177
Forestry Incentives and other programs 5/	0	1,989	0	1,754	0 13
Asian Gypsy Moth	0	5,210	0	0	0 0
Subtotal	34	195,104	97	167,447	-65 17
Human Resource programs					
Job Corps	0	76,225	0	67,689	0 13
Senior Community Service Employment	0	19,043	0	24,290	0 -22
Subtotal	0	95,268	0	91,979	0 4
Grand total, all programs	1,394,339	3,414,972	1,441,634	2,974,659	-3 15
Cash receipts distributed to States, counties and Puerto Rico					
Payments to States and Puerto Rico	0	329,211	0	327,180	0 1
Payment to Minnesota	0	1,255	0	1,251	0 0
Payments to counties, (National Grasslands and Land Utilization Areas)	0	7,548	0	1,730	0 336
Total	0	338,014	0	330,161	0 2
Internal equipment and supply service (Working Capital)	150,070	118,362	135,610	113,415	11 4
Reimbursements for work performed for government and others included above	0	105,052	0	103,679	0 1

1/ Obligations were incurred on a "charged-as-worked" basis.

2/ K-V = Knutson-Vandenberg.

3/ Includes sale of personal property and acquisitions of lands to complete land exchanges.

4/ Receipts not available as a separate item after FY 1987.

5/ Includes Resource Conservation and Development, River Basins, and Pesticide Impact assessment funds transferred from Agricultural Research Service.

Table 63—Statement of receipts—fiscal years 1988-92

	1992	1991	1990	1989	1988
	<i>1,000 dollars actual</i>				
Receipts from sale and use of forest resources					
Timber and forest products	520,003	667,072	849,468	909,516	888,373
Grazing	10,780	11,457	10,418	10,949	8,738
Land uses	5,244	5,011	5,008	4,508	4,472
Recreation	46,605	43,013	41,335	38,132	34,307
Power	1,254	1,144	991	871	824
Minerals	30,402	43,947	64,116	86,838	43,447 1/
Subtotal	614,288	771,644	971,336	1,050,814	980,161
Receipts from deposits for expenditures on National Forests					
Timber sale area betterment	251,267	197,399	206,489	241,706	238,002
Timber salvage sales	171,831	144,194	163,383	131,957	29,174
Brush disposal	30,271	40,468	47,121	54,456	58,606
Restoration of Forest Service lands and improvements	140	140	94	122	80
Cooperative work	52,110	54,575	53,648	52,557	58,332
Operation and maintenance of quarters	6,531	6,364	6,076	5,648	5,610
Gifts, donations, and bequests	742	1,887	1,749	2,090	1,577
Subtotal	512,892	445,027	478,560	488,536	391,381
Other receipts					
Miscellaneous (sales, rents, etc.)	6,202	8,695	5,438	8,505	9,889
Golden Eagle passports	8	6	8	-9	23
Sale of personal property	0	0	21	23	3
Royalties from sale of Smokey Bear and Woodsy Owl products	34	97	115	77	106
Acquisition of lands to complete land exchanges	154	105	13	325	325
Gifts, donations, and bequests for forest rangeland research	7	31	3	2	3
Subtotal	6,405	8,934	5,598	8,923	10,349

See footnotes at end of table.

Table 63--Statement of receipts--fiscal years 1988-92--Continued

	1992	1991	1990	1989	1988
<i>1,000 dollars actual</i>					
Other income					
Estimated collections by Department of Energy for power licenses on proclaimed National Forest land	1,874	1,450	1,720	1,722	1,175
Estimated collections by Department of the Interior for mineral leases on proclaimed National Forest land ^{2/}	170,000	110,000	131,000	100,300	105,700
Value of roads built by timber purchasers applied in lieu of cash payment for timber	88,880	104,579	104,864	106,541	98,002
Subtotal	260,754	216,029	237,584	208,563	204,877
Total	1,394,339	1,441,634	1,693,078	1,756,836	1,586,768
Other net deposits					
Monies advanced on active timber sales ^{3/}					
Balance from previous year	209,729	238,095	260,668	253,237	247,250
Deposited current year	1,019,725	1,050,986	1,380,031	1,397,928	1,350,365
Transferred to other accounts	-1,055,619	-1,079,352	-1,402,604	-1,390,497	-1,344,378
Balance on deposit	173,835	209,729	238,095	260,668	253,237
Amounts deposited pending disposition ^{4/}					
Balance from previous year	28,045	19,296	28,351	27,610	16,492
Deposited current year	17,039	10,593	-6,393	9,609	14,790
Transferred to other accounts	-1,554	-1,844	-2,662	-8,868	-3,672
Balance on deposit	43,530	28,045	19,296	28,351	27,610
Subtotal	217,365	237,774	257,391	289,019	280,847
Total	1,611,704	1,679,408	1,950,469	2,045,855	1,867,615

1/ Includes \$19 million adjusted windfall profit tax payment for 1980-84.

2/ Oil production figures for FY 1988 through FY 1990 have been revised due to improved estimating methods.

3/ Timber sale deposits made by timber purchasers.

4/ Budget clearing account.

Table 64—Statement of receipts—fiscal year 1992

	National Forests	Oregon and California grant lands	National Grasslands & L.U. Areas 1/ 1,000 dollars	Other	Total
Receipts from sale and use of forest resources					
Timber and forest products					
Grazing	504,592	15,397	14		520,003
Land uses	9,464	2	1,314		10,780
Recreation	4,983	3	258		5,244
Power	46,490	98	17		46,605
Minerals	1,245	0	9		1,254
	9,133	0	21,269		30,402
Subtotal	575,907	15,500	22,881		614,288
Receipts from deposits for expenditures on National Forests					
Timber sale area betterment	251,267				251,267
Timber salvage sales	171,831				171,831
Brush disposal	30,271				30,271
Restoration of Forest Service lands and improvements	140				140
Cooperative work	52,110				52,110
Operation and maintenance of quarters	6,531				6,531
Gifts, donations, and bequests	742				742
Subtotal	512,892				512,892
Other receipts					
Miscellaneous (sales, rents, etc.)				6,202	6,202
Golden Eagle passports				8	8
Royalties from sale of Smokey Bear and Woodsy Owl products				34	34
Acquisition of lands to complete land exchanges				154	154
Gifts, donations, and bequests for forest rangeland research				7	7
Subtotal				6,405	6,405

See footnotes at end of table

Table 64--Statement of receipts--fiscal year 1992--Continued

	National Forests	Oregon and California grant lands	National Grasslands & L.U. Areas 1/	Other	Total
Other income			1,000 dollars		
Estimated collections by Department of Energy for power licenses on proclaimed National Forest land	1,874				1,874
Estimated collections by Department of the Interior for mineral leases on proclaimed National Forest land	170,000				170,000
Value of roads built by timber purchasers in lieu of cash	88,880				88,880
Subtotal	260,754				260,754
Total	1,349,553	15,500	22,881	6,405	1,394,339
Other net deposits					
Monies advanced on active timber sales					
Balance from previous year	209,729				209,729
Deposited current year	1,019,725				1,019,725
Transferred to other accounts	-1,055,619				-1,055,619
Balance on deposit (subtotal)	173,835				173,835
Amounts deposited pending disposition					
Balance from previous year	28,045				28,045
Deposited current year	17,039				17,039
Transferred to other accounts	-1,554				-1,554
Balance on deposit (subtotal)	43,530				43,530
Total	217,365				217,365
Grand total	1,566,918	15,500	22,881	6,405	1,611,704

1/ Land utilization projects.

	Total 2/	Work for other public agencies (reimbursables)
	1,000 dollars	
National Forest System		
Protection and management	1,053,353	35,256
Fighting forest fires	295,271 3/	10,766
Cooperative work for others	42,944	0
Cooperative law enforcement	7,680	0
Flood prevention and watershed protection	374	0
Restoration of forest lands and improvements	165	0
Reforestation and timber stand improvement 3/	55,615	0
Timber sale betterment (K-V) 4/	292,942	0
Brush disposal	52,058	0
Timber salvage sales	130,385	0
Range betterment	5,166	0
Construction of facilities	34	0
Acquisition of lands, Forest Service	1,507	0
Acquisition of lands, Land and Water Conservation Fund	114,613	0
Construction of forest roads and trails	207,113	642
Timber purchaser roads constructed by the Forest Service	4,706	0
Restoration of roads, Federal Highway funds	5,527	0
Road construction, Mount St. Helens, highway trust	301	0
Road and trail maintenance	31,710	0
Tongass Timber Supply Fund	2,894	-47
General Administration	313,362	0
Operation and maintenance of quarters	5,656	0
Hazardous waste management	17,490	0
Department of Transportation-Coast Guard	3	0
Resource management timber receipts	434	0
Fire protection	187,245	912
Strawberry Valley land transfer	-40	0
Subtotal 2/	2,828,508	47,529
Research		
Tongass Timber Supply Fund	76	0
Forest research	212,274	24,497
Construction of research facilities	76,228	3,772
Cooperative research	6,468	0
Gifts, donations, and bequests for forest and rangeland research	1,046	0
Subtotal 2/	296,092	28,269

See footnotes at end of table.

	Total 2/	Work for other public agencies (reimbursable)
	1,000 dollars	
State and Private Forestry		
Cooperation and general forestry assistance	182,198	8,611
Resource conservation and development	850	0
Rural community fire protection grants	3,361	0
River basins	781	0
Flood prevention and watershed planning	2,227	0
Licensee programs - Smokey Bear and Woodsy Owl	119	0
Pesticide Impact Assessment	358	0
Asian Gypsy Moth	5,210	0
Subtotal 2/	195,104	8,611
Human Resource Programs		
Job Corps	76,225	1,600
Senior Community Service Employment Program	19,043	19,043
Subtotal 2/	95,268	20,643
Total 2/	3,414,972	105,052
Internal equipment and supplies service		
Working Capital Fund (subtotal)	118,362	118,362
Grand total 2/	3,533,334	223,414

1/ Obligations were incurred on a "charged-as-worked" basis.

2/ May not add due to rounding

3/ Includes obligations of \$31,132,622.94 for Reforestation Trust Fund.

4/ K-V = Knutson-Vandenberg Act.

	1992	1991	1990	1989	1988
<i>Million dollars actual</i>					
National Forest System	2,828.5	2,516.7	3,089.7	2,747.2	2,254.6
Forest Research	296.1	205.1	163.1	153.1	153.2
State and Private Forestry	195.1	167.4	123.3	89.5	98.7
Human Resource Programs	95.2	85.4	85.5	82.9	83.4
Working Capital Fund	118.4	113.4	114.5	118.7	102.8
Total	3,533.3	3,088.0	3,576.1	3,191.4	2,692.7

Item	Units 1/	Quantity	Average value per unit	Total value
				Million dollars
Value				
Minerals 2/				
Common variety	- 3/	-	-	60
Locatable	- 3/	-	-	675
Leasable				
Oil	BBL	11,000,000	17.16	188.8
Gas	MCF	210,000,000	1.75	367.5
Coal	Tons	85,000,000	9.00	765.0
Others	- 3/	-	-	250.0
Timber	MBF	7,290	128.20 4/	934.5
Recreation	RVD	287,690,000 5/	27.26 6/	6,866.8 6/
Wilderness and primitive areas	RVD	13,272,000	36.76	488.9
Wildlife and fish				
Recreation	AD	105,200,000	35.31	3,736.0
Commercial	Pounds	199,000,000	1.06	211.0
Range 7/	AUM	7,597,704	1.42	10.8
Total value				14,554.30
Expenditures				
National Forest System				2,828.5
Forest Research				296.1
State and Private Forestry				195.1
Human Resource Programs				95.2
Working Capital Fund				118.4
Total expenditures				3,533.3
Net value, total				11,021.0
Net value, National Forest System only				11,725.8

1/ BBL = barrels; MCF = thousand cubic feet; tons = tons; MBF = thousand board feet;
RVD = recreation visitor days; pounds = thousand pounds; AUM = animal unit months;
AD = activity days.

2/ Minerals data estimated.

3/ Units for common variety and locatable minerals are not standard.

4/ Actual value at time of sale.

5/ Includes wilderness, wildlife, and fish.

6/ Average value per unit and total value for M RVD's excludes recreation related M WFUD's and wilderness M RVD's.

7/ Based on actually grazed animal unit months of forage. Value is a Forest Service-wide weighted average based on maximum ability to pay. Ability to pay reflects income derived by the user from use of the resource.



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Accessible: Describes a site, building, program, or service that can be approached, entered, and used by a person with a mobility, sensory, or cognitive disability.

Accessibility: The property of a site, building, program, or service that allows it to be approached, entered, and used by a person with a mobility, sensory, or cognitive disability.

Anadromous fish: Fish species, including salmon, steelhead, and sea-run cutthroat trout, that migrate from the sea up freshwater rivers and streams to spawn.

AUM (animal unit month): The amount of forage needed to support a mature 1,000-pound cow or its equivalent for one month (also see Head Month).

***Bacillus thuringiensis*:** Scientific name of a bacterium that is pathogenic to the larval stage of many lepidopterous insects (moths and butterflies).

Bt: Abbreviation for *Bacillus thuringiensis*, a bacterial insecticide.

Biological diversity: See Diversity.

Buffering capacity: The ability of a lake to withstand changes in the pH (measure of acidity) of its water from acid deposition or other sources of acid or alkaline substances. (The larger the buffering capacity, the lower the sensitivity to changes in pH.)

Class I airshed: Part of a classification system defined in the Clean Air Act of 1977 denoting the increment above which deterioration of air quality is regarded as significant and not allowed to occur. Class I allows the least deterioration. Congress has designated 88 wilderness areas on the National Forest System as Class I airsheds.

Dimilin: An insecticide that acts as a growth regulator and prevents gypsy moths from completing development.

Diversity: The distribution and abundance of plant and animal communities and species.

Douglas-fir tussock moth: A foliage-feeding native insect, *Orgyia pseudotsugata*, of the Western United States. It feeds generally on Douglas-fir and true firs.

Ecosystem: A complete interacting system of organisms and their environment.

Endangered species: As defined under the Endangered Species Act (1973), a federally listed plant and animal species in danger of extinction throughout all or a significant portion of its range.

Fire severity index: A measurable factor—such as precipitation, fuel moisture, and spring snowpacks—expressed as a percent of normal, to show the potential for severe wildfire conditions.

Forest plans: The National Forest Management Act (NFMA) of 1976 requires forest plans be developed for each national forest. The forest plan establishes direction for the multiple-use management of natural resources and includes land allocations and measures for environmental protection. Land allocations identify what uses are permissible and under what conditions.

Fumigant: A pesticide used in gaseous form.

Fungicide: A pesticide for control of fungi.

Grazing allotment: Designated area of land available for livestock grazing under permit.

GYPCHEK: A trade name for biological insecticide containing a virus specific to gypsy moth.

Gypsy moth: A nonnative foliage-feeding insect, *Lymantria dispar*, introduced into the United States in 1869 and spreading through much of America. It feeds on several hundred different species of trees and shrubs.

Habitat: The physical and environmental attributes necessary to support an organism.

Head month: For grazing fee purposes, it is one month's use and occupancy of range by one weaned or adult cow with or without calf, bull, steer, heifer, horse, burro, or mule; or five sheep or goats.

Herbicide: A pesticide for control of unwanted vegetation.

IMPROVE network: An interagency effort, headed by the Environmental Protection Agency, to monitor air visibility within and adjacent to selected Class 1 airsheds.

Insecticide: A pesticide for control of insects.

LMP (land management planning): The process by which the forest plans, required by the National Forest Management Act, are completed.

MCF (thousand cubic feet): A unit of volume used to measure the amount of wood in logs. One cubic foot equals the volume in a cube 12 inches by 12 inches by 12 inches.

MMCF (million cubic feet): A unit of volume equal to 1,000 MCF.

MBF (thousand board feet): A unit of volume used to measure the amount of lumber that could be made from logs. One board foot equals a board one inch by 12 inches by 12 inches.

MMBF (million board feet): A unit of volume equal to 1,000 MBF.

Mountain pine beetle: A bark-feeding native insect, *Dendroctonus ponderosae*, of the Western United States. It feeds on several species of pines.

National Forest: 1) A unit of federally owned land reserved or withdrawn from the public domain or acquired through purchase, exchange, or donation, and proclaimed by Congress as a national forest; 2) An administrative unit of the National Forest System.

National Grassland: Lands designated national grasslands by the Secretary of Agriculture and permanently held by the U.S. Department of Agriculture under Title III of the Bankhead-Jones Farm Tenant Act.

NFS (National Forest System): 1) Defined by Congress in 1974 as units of federally owned lands in the United States and its territories which are united into one integral system and dedicated to the long-term benefit of present and future generations. The system consists of all national forest lands reserved or withdrawn from the public domain of the United States or acquired through purchase, exchange, donation, or other means. Also included are the national grasslands and land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act and other lands, waters, or interests administered by the USDA Forest Service. 2) The branch of the USDA Forest Service established to protect and manage the National Forest System.

Permitted livestock: Livestock presently being grazed on an allotment under permit or those that were grazed under a permit during the preceding season, including their offspring retained for herd replacement.

Pesticide: Any substance or mixture of substances intended for controlling insects, rodents, fungi, weeds, and other forms of plants or animal life that are considered to be pests.

Piscicide: A pesticide used for control of fish.

Predacide: A pesticide used for control of predators.

Range Betterment Fund: A fund established by Title IV, section 401 (b)(1), of the Federal Land Policy and Management Act of 1976. Use is limited to National Forest System lands in the 16 contiguous Western States. Funds are used to arrest range deterioration and improve forage conditions on deteriorated ranges to benefit forage production for livestock, wildlife, and watershed conditions.

Rangelands: Lands on which the native vegetation is predominately grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing use. Forested sites and nonforested sites providing forage and habitat for domestic and wild herbivores are included.

Recovery: The process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized so that its long-term survival in nature can be ensured. The goal of this process is the maintenance of secure, self-sustaining wild populations of species with the minimum necessary investment of resources.

Recreational rivers: River or sections of rivers that are readily accessible by road or railroad that may have some development along their shoreline, and that may have undergone some impoundment or diversion in the past.

Repellent: A pesticide used to keep animal pests away.

Research Natural Area: Part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on the National Forest System. Research Natural Areas are for nonmanipulative research, observation, and study.

Riparian areas: Land situated along the bank of a stream or other body of water, usually characterized by plant communities dependent on the presence of free or unbound water at or near the ground surface.

Rodenticide: A pesticide used for rodent control.

RVD (recreation visitor day): One recreation visitor day is the recreation use of the National Forest System land or water that aggregates to 12 visitor-hours. This may entail one person for 12 hours, 12 persons for one hour, or any equivalent combination of individual or group use, either continuous or intermittent.

Scenic rivers: Rivers or sections of rivers that are free of human-made impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Sensitive species: Species occurring on the National Forest System for which population viability is a concern. Sensitive species are designated by Regional Foresters and are managed to prevent the need for Federal listing as either threatened or endangered.

Silvics: The study of the life history and general characteristics of forest trees and stands, with particular reference to locality factors (environment) as a basis for the practice of silviculture.

Silviculture: The science and art of cultivating forests based on knowledge of silvics; more particularly, the theory and practice of controlling the establishment, composition, constitution, and growth of forests.

SOURCE: A correspondence course (NR435/DCE153) on valuation and landownership adjustment.

Southern pine beetle: A bark-feeding native insect, *Dendroctonus frontalis*, of the Southeastern United States. It feeds on several species of southern pine.

Spruce beetle: A bark-feeding native insect, *Dendroctonus rufipennis*, of the northern portions of North America.

S&PF (State and Private Forestry): A branch of the USDA Forest Service that provides technical assistance and expertise to State and local governments, and to private landowners.

Stand (trees): A community of naturally or artificially established trees of any age sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities, thereby forming a silvicultural or management entity.

Suitable range: Land that is accessible, or can become accessible, to livestock and produces, or can produce, forage and can be grazed on a sustained-yield basis under reasonable management guidelines.

Threatened species: As defined under the Endangered Species Act (1973), a federally listed plant and animal species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Unsuitable range: Land that should not or cannot be grazed because of unstable soils, steep topography, or low potential for forage production.

Viable population: A population of plants or animals whose estimated number and distribution of reproductive individuals provides a high likelihood of continued existence, generally throughout its current range.

Visibility monitoring site: A location equipped with automatic cameras that take photographs of the landscape at predetermined intervals of time to record the degree of smoke, haze, and other impediments to visibility of the air column.

Western spruce budworm: A foliage-feeding native insect, *Choristoneura occidentalis*, of the Western United States. It feeds on Douglas-fir and several species of true firs and spruce.

WFUD (wildlife fish user-day): One wildlife fish user-day is the recreation use of National Forest System land or water that aggregates to 12 visitor-hours. This may entail one person for 12 hours, 12 persons for one hour, or any equivalent combination of individual or group use, either continuous or intermittent, in order to hunt, fish, view, or study wildlife and/or fish.

Wild and scenic river: A river and its adjacent area designated for inclusion in the National Wild and Scenic Rivers System, as established by Congress in Public Law 90-542 (October 2, 1968), to "preserve certain rivers with outstanding natural, cultural, or recreational features in a free-flowing condition for the enjoyment of present and future generations." The National Wild and Scenic Rivers Act classifies rivers as "wild," "scenic," or "recreational." Regardless of classification, each designated river is administered with the goal of nondegradation and enhancement of the values which caused it to be designated.

Wild rivers: Rivers or sections of rivers that are free of human-made impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.

Wilderness area: An area of undeveloped Federal land that Congress designated as wilderness and that retains its primeval character and influence, without permanent improvements or human habitation, and is protected and managed to preserve its natural conditions. An area that: 1) generally appears to have been affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable; 2) has outstanding opportunities for solitude, or a primitive and unconfined type of recreation; 3) comprises at least 5,000 acres of land or is of sufficient size to make practicable its preservation and use in an unimpaired condition; and 4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value (Wilderness Act, 1964).



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Legislative basis. Required by Section 8 (c) of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (88 Stat. 476, as amended; 16 U.S.C. 1601-1614).

Purpose of Report. To provide information to Congress to assist them in their oversight responsibilities and to improve the accountability of agency (Forest Service) expenditures and activities.

Responsibility. Secretary of Agriculture to submit annual report at time of submission of the annual fiscal budget.

Content Requirements for Report. The Report will:

- Evaluate the component elements of the Renewable Resource Program. The Program shall be developed in accordance with principles set forth in Multiple-Use Sustained-Yield Act of 1960 and the National Environmental Policy Act of 1969 (Sec 4). The components are:

National Forest System Component—protection, management and development of the National Forest System, including forest roads and trails.

State and Private Component—Forest Service Cooperative Programs.

International Forestry Component—international conservation programs.

Research Component—the status of major research programs, significant findings and how these findings will be applied in National Forest System management (RPA Sec. 8 (c)).

Other Forest Service Activities—response(s) to findings of the RPA Assessment.

- Set forth progress in implementing the RPA Program (Sec. 8 (d)).
- Cite accomplishments of the RPA Program as they relate to the objectives of the Assessment, in qualitative and quantitative terms (Sec. 8 (d)).
- Contain appropriate measures of pertinent costs and benefits, assessing the balance between economic factors and environmental quality factors (Sec. 8 (d)).
- Indicate plans for implementing corrective actions and recommendations for new legislation where warranted (Sec. 8 (e)).
- Cite the amounts, types, and uses of herbicides and pesticides used in the National Forest System, including the beneficial or adverse effects of such uses (Sec. 3 (e)).
- Status on the progress of incorporation of mandated standards and guidelines into land and resource management plans (Sec. 6 (c)).

Report Format. The annual reports will be structured for Congress in a concise summary form with necessary data in appendices (Sec. 8 (f)).



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A

Accessibility 57
 Acid rain 77
 Administration 81
 Administrative appeals of forest plans 28
 Administrative appeals of timber sales 46
 Agency work force 84
 Air resource management 52
 Alabama A&M University 84
 Allegheny National Forest 23
 Alturas Lake Creek 20
 America the Beautiful Act 12, 43
 America's Great Outdoors initiative (AGO) 6, 37
 Anadromous fish 33, 75
 Aviation management 40

B

Bacillus thuringiensis 43, 65
 Bark beetles 43, 64
 Bridges 57
 Buildings 57
 Bull's Eye 23

C

California spotted owl 34, 75
 Central Utah Project 17
 Challenge cost-share 31, 36
 Change on the Range initiative 9, 49
 Chief's message 1
 Civil rights 81
 Clearcuts 7, 46
 Cooperative fire protection 67
 Cooperative forestry 59, 71
 Cooperative research 73
 Cooperative watershed activities 63
 Cultural resource management 39

D

Department of Agriculture Demonstration Project 84
 Diamond Fork 17
 Disabled employees 84
 Disaster Assistance Support Program 70
 Drug activities on the national forests 40

E

Economic diversification studies 66
 Ecosystem management 3, 26, 74
 Endangered species 34
 Engineering 54
 Environmentally acceptable commodity production 7, 76
 Equipment management 58
 Every Species Counts Program 34
 Expenditures, receipts and 85
 Exports, timber 48

F

Federal disaster assistance 68, 70
 Federal Register 27
 Fire and aviation management 40
 Fire prevention 42
 Fire presuppression 41
 Fish habitat 32
 Forest environmental research 73
 Forest fires 40
 Forest fuels management 42
 Forest health 10, 65, 77
 Forest Legacy program 65
 Forest management 43, 59
 Forest management research 73
 Forest pest management 42, 64, 72
 Forest plans 27
 Forest stewardship 59
 Forestry incentives 63

G

Geology management 54
 Geothermal energy 53
 Get Wild Program 31
 Global change 73
 Glossary of Terms 202
 Grazing fees 49
 Grizzly bears 34
 Gypsy moth 43, 64, 77

H

Haskell Indian Junior College 84
 Historically Black Colleges and University Program 13, 81
 Hosted Programs 82
 Human resource programs 81
 Hurricanes Andrew and Iniki 68

I

Improving scientific knowledge about natural resources 9, 77
 Information management 14, 83
 Inland fish 32
 International Institute of Tropical Forestry 1, 11, 70
 International fire assistance 72
 International forestry 3, 11, 69
 Interpretive services 36
 Inventory 43, 51

J

Job Corps 57, 81
 Job Training Partnership Act 81

K

Keep America Beautiful, Inc. 82

L

Land acquisitions 29
 Land and Water Conservation Fund 29
 Land exchanges 29
 Land management planning 27
 Landline location 28
 Law enforcement 39
 Leave No Trace Program 6
 Legislative basis 208
 Livestock grazing 50

M

Measures of Performance 4
 Minerals management, leasable, locatable, materials 53
 Monitoring, soil, water 51
 Mountain pine beetle 43, 64
 Multicultural organization 13, 81
 Multiple-use management 17, 74

N

National Environmental Policy Act (NEPA) 9, 28, 84
 National Forest Management Act (NFMA) 26, 46
 National Forest System 3, 17
 National Recreation Areas 39
 Natural resource conservation education 66
 National Scenic Area 39
 National Wilderness Preservation System 7, 39
 Neotropical migratory birds 31
 New Perspectives 3, 26
 Northern Forest Lands Council 65
 Northern spotted owl 7, 34
 Noxious weeds 49
 Nursery, trees 44

O

Office of International Cooperation and Development (OICD) 11, 70
 Old-growth forests 74
 Older Americans 82
 Opportunity L.A. 13, 86
 Overview 2
 Owls Nest 23

P

Pacific yew 9, 48
 Partnerships 31, 38
 Passport in Time Program 17, 38
 Pest management 42, 64
 Pesticide use 43
 Pinchot Institute for Conservation Studies 66
 Prescribed burns 42
 Procurement and property 85
 Program Performance and Accomplishments 16
 Public involvement 86

R

Rangeland management 49
 Receipts and expenditures 85
 Reclamation 53
 Recreation facilities 38
 Recreation user days 5
 Recreation, cultural resources, and wilderness management 35
 Recreation trends 37
 Recreation, wildlife, and fisheries enhancement 5, 75
 Recycling 61, 78, 85
 Red-cockaded woodpecker 34
 Reforestation 43
 Regreen L.A. 13
 Remote sensing 58
 Research 3, 10, 73
 Research mission 73
 Resource analysis research 73
 Resource conservation and development 64
 Resource Planning Act (RPA) 3, 59
 Responding to global resource issues 11, 79
 Rights-of-way 29
 Riparian and wetland management 50
 Rise to the Future fisheries program 32
 Road improvements 55
 Road operation and maintenance 54
 RPA Program, 1990 5, 73
 Rural America 60
 Rural community fire protection 68
 Rural Development initiative 60
 Rural Development Strategic Plan 60

S

Salvage Sale Program 46
 Sawtooth National Forest 20
 Scenic byways 38
 Seedlings, nursery, and tree improvement 62
 Senior Community Service Employment Program (SCSEP) 13, 82
 Sensitive species 34
 Small Tracts Act parcels 29
 Smokey Bear Fire Prevention Program 67
 Soil, water, air, and weather management 50
 Southern pine beetle 43, 77
 Special land uses 30
 Special recreation areas 39
 State and Private Forestry 3, 59
 Strawberry Valley 17

T

Tables 88
 Taxation 62
 Taxol 1, 9, 48
 Themes, RPA Program 5
 Threatened species 34
 Timber Bridge initiative 61
 Timber exports 48
 Timber Sale Program Information Reporting System (TSPIRS) 46
 Timber sales 45
 Timber sold and harvested 46
 Timber stand improvement 44
 Touch America Project (TAP) 37
 Trails, recreation 38
 Tree improvement 43, 62
 Tropical forestry 71

U

Uinta National Forest 17
 United Nations Conference on the Environment and Development (UNCED) 1, 11, 69
 United States Agency for International Development (USAID) 11, 28, 69
 Upper South Fork Boise River 21
 Urban and community forestry 59
 Urban Greening initiative 87

V

Volunteers on the National Forest System 36, 82

W

Water quality 51
Water rights adjudications 53
Weather program 52
Wetlands 50
Wild and scenic rivers 7, 38
Wilderness 39
Wildfire 40, 67
Wildland/urban interface, natural disasters 42, 67
Wildlife and Fisheries Habitat Relationship (WFHR)
program 35
Wildlife, fish, and rare plants management 30
Wildlife/fish user days 6, 36
Windows on the Past Program 39
Wood utilization 61
Work force diversity 84

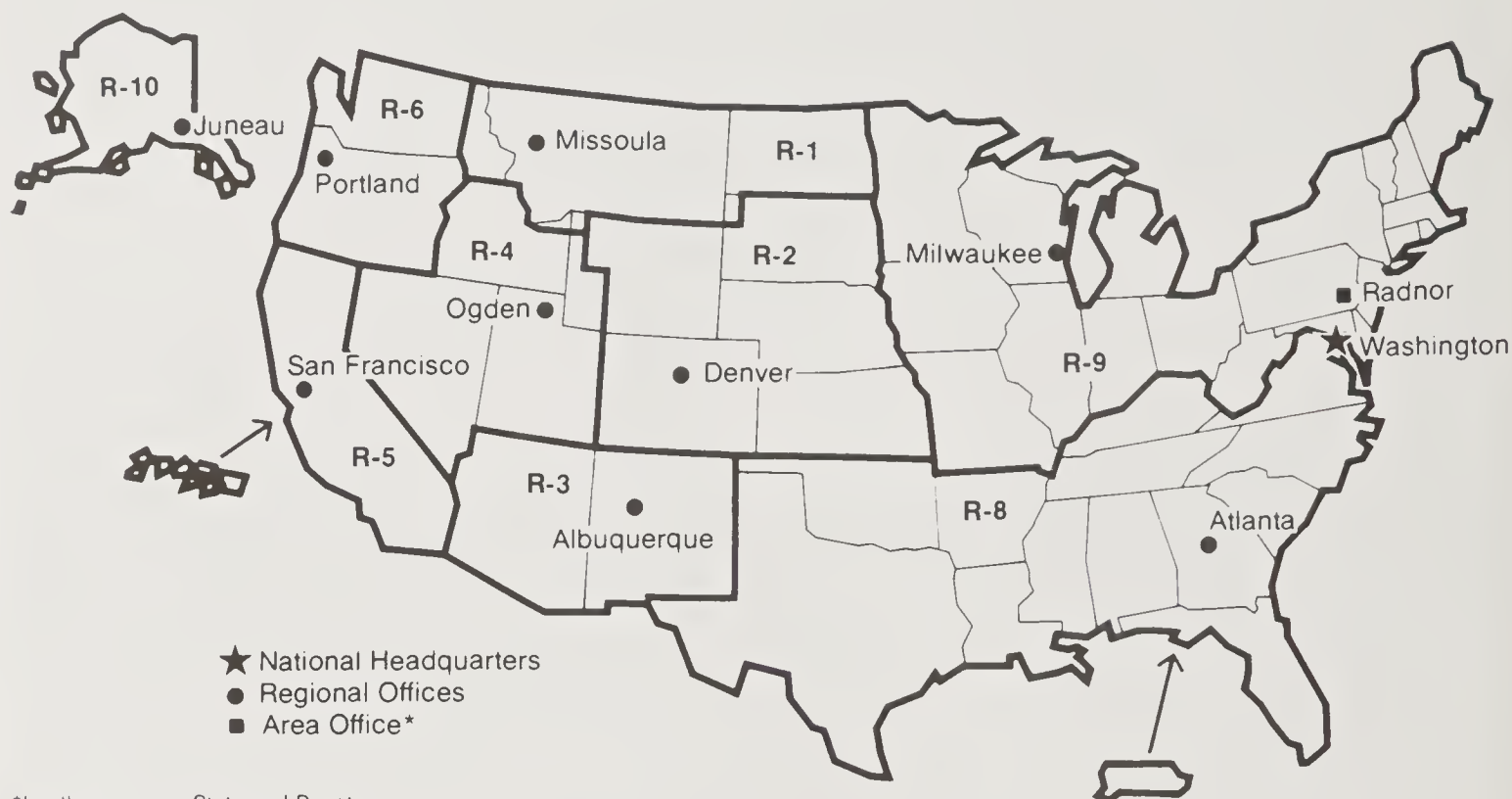
Y

Youth Conservation Corps 82



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*In other regions, State and Private Forestry activities are directed from Regional Offices

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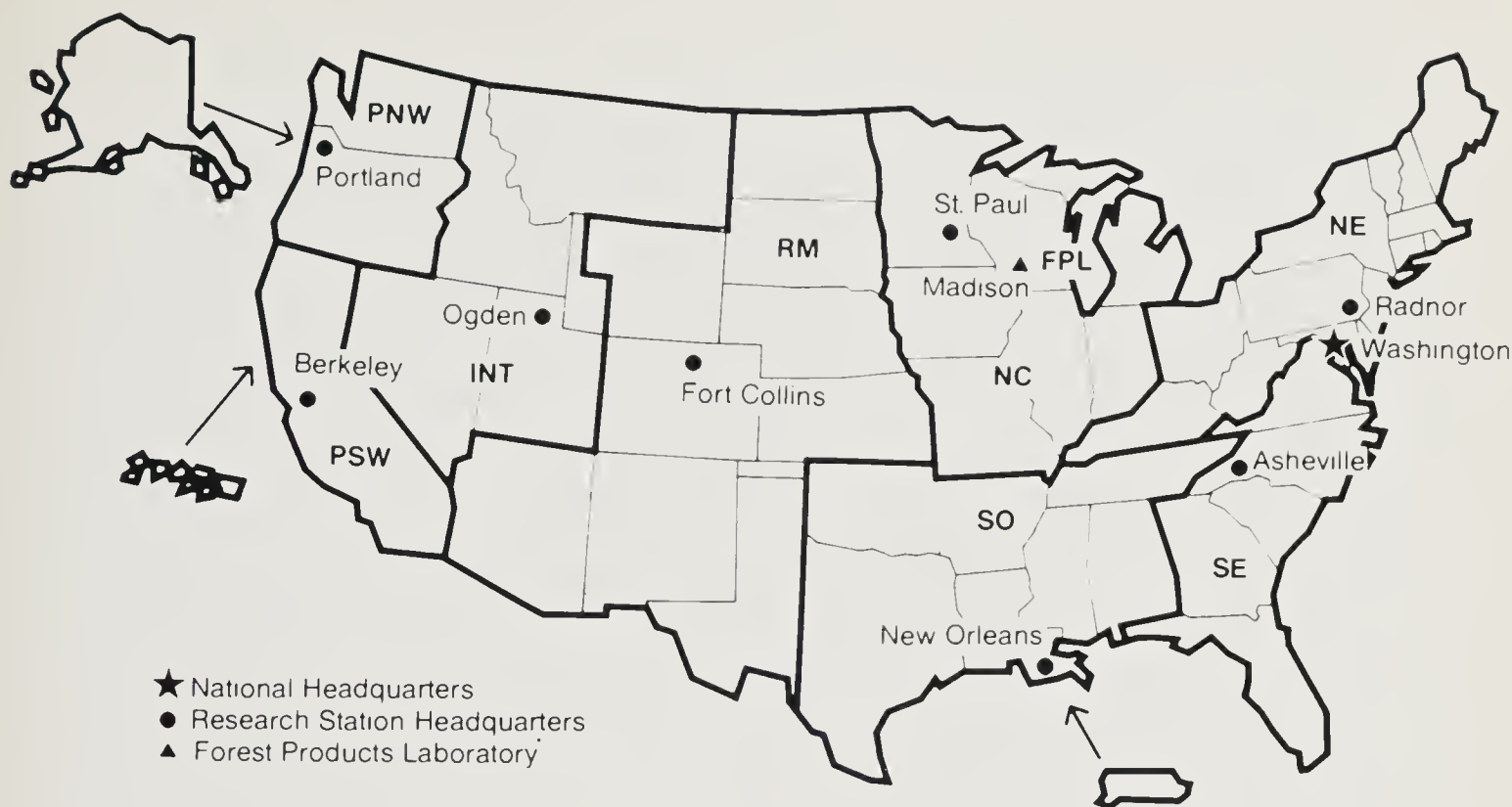
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